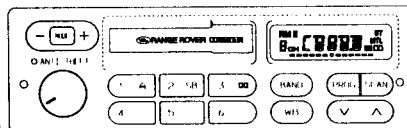


Service Manual

PIONEER
The Art of Entertainment



ORDER NO.
CRT1465

ANTI-THEFT CD-READY RADIO

KEX-910ZRV

US, X1H

Note:

- See the separate manual CX-156 (CRT-468) for the cassette mechanism description.
- Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation. "Dolby" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.
- RANGE ROVER OF NORTH AMERICA, INC. Part No. : RTC7713.

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1. SPECIFICATIONS

TUNER

FM Receiver

Usable Sensitivity (Load)	1 μ V
[30 dB(N + D)/(S + N + D)]	70 dB
Signal/Noise Ratio (1 mV)	1 V
Overload Signal	40 dB
AM Rejection	110 dB
IF Rejection	60 dB
Image Rejection	70 dB
Spurious Rejection	60 dB
Alternate Channel Selectivity	2 dB
Capture Ratio	45 dB
Stereo Separation (1 kHz)	0.5%
Stereo Distortion (1 mV)	87.7 to 107.9 MHz
Frequency Range	10.7 MHz
Intermediate Frequency	

AM Receiver

Usable Sensitivity [20 dB N/(S + N)]	10 μ V
Signal/Noise Ratio (5 mV)	60 dB
Selectivity (± 10 kHz)	110 dB
IF Rejection	110 dB
Image Rejection	60 dB
Distortion (5 mV RF)	0.5%
Frequency Range	530 to 1710 kHz
Intermediate Frequency	450 kHz

WB Receiver

Usable Sensitivity (Load)	0.3 μ V
[20 dB(S + N)/(S + N + D)]	65 dB
Signal/Noise Ratio (1 mV)	0.6%
Distortion	162.400 to 162.550 MHz
Frequency Range	(25 kHz Step)
Intermediate Frequency	
1st I.F	10.7 MHz
2nd I.F	450 kHz

CASSETTE DECK

Wow and Flutter WRMS-JIS	0.07%
Signal/Noise Ratio	50 dB
Dolby [®] B NR Effect	10 dB
Separation	50 dB
Cross Talk	55 dB
Distortion	1%
Frequency Response (-3 dB)	
Normal	40 Hz to 15 kHz
Metal	40 Hz to 18 kHz

AUDIO CONTROL

Tone Control Response	
Treble Boost/Cut 10 kHz	± 10 dB
Bass Boost/Cut 100 Hz	± 10 dB

2. DISASSEMBLY

● Case

1. Insert and turn a flat screwdriver to remove case.
2. Raise case to remove.

● Grille Assy

1. Remove knob.
2. Press tab at five locations indicated by arrows, and pull out grille assy.

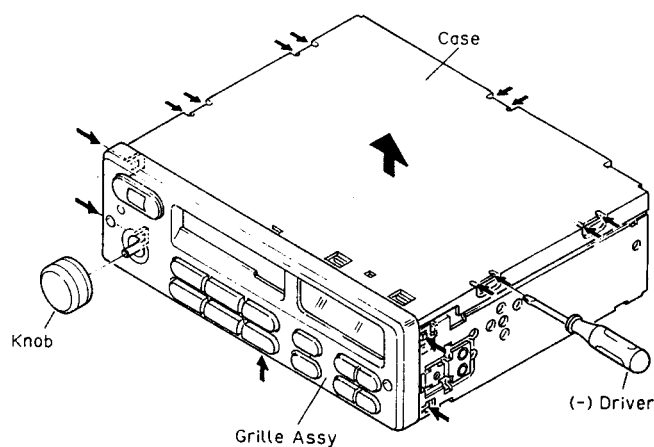


Fig. 1

● Cassette Mechanism Assy

1. Remove four screws.
2. Disconnect connector, and then raise cassette mechanism assy to remove.

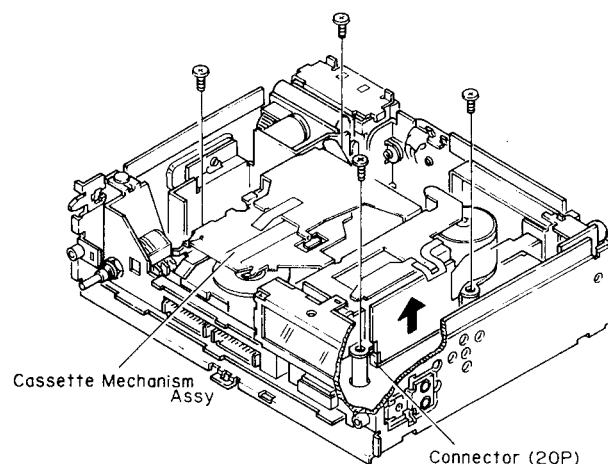


Fig. 2

● Chassis Assy

1. Remove two screws. (Fig. 3)
2. Raise up on power supply unit and LCD unit. (Fig. 3)
3. Remove five screws and holder. (Fig. 4)
4. Unbend the claws indicated by arrow until straight. (Fig. 4)
5. Raise up on tuner amp unit to remove it from the chassis assy. (Fig. 4)

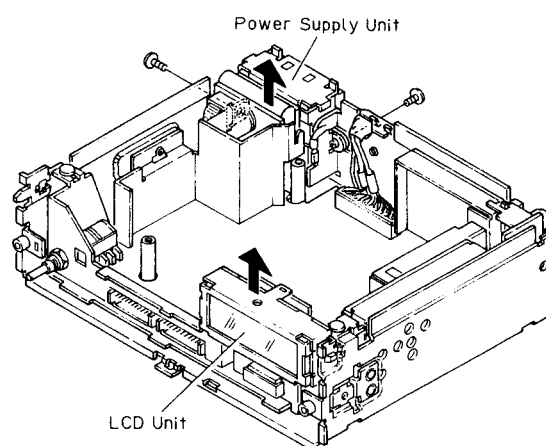


Fig. 3

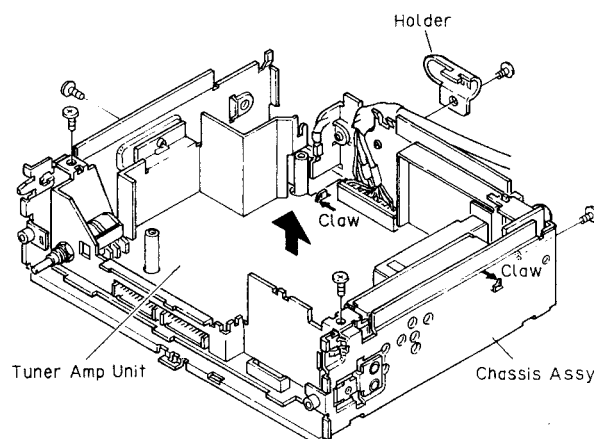


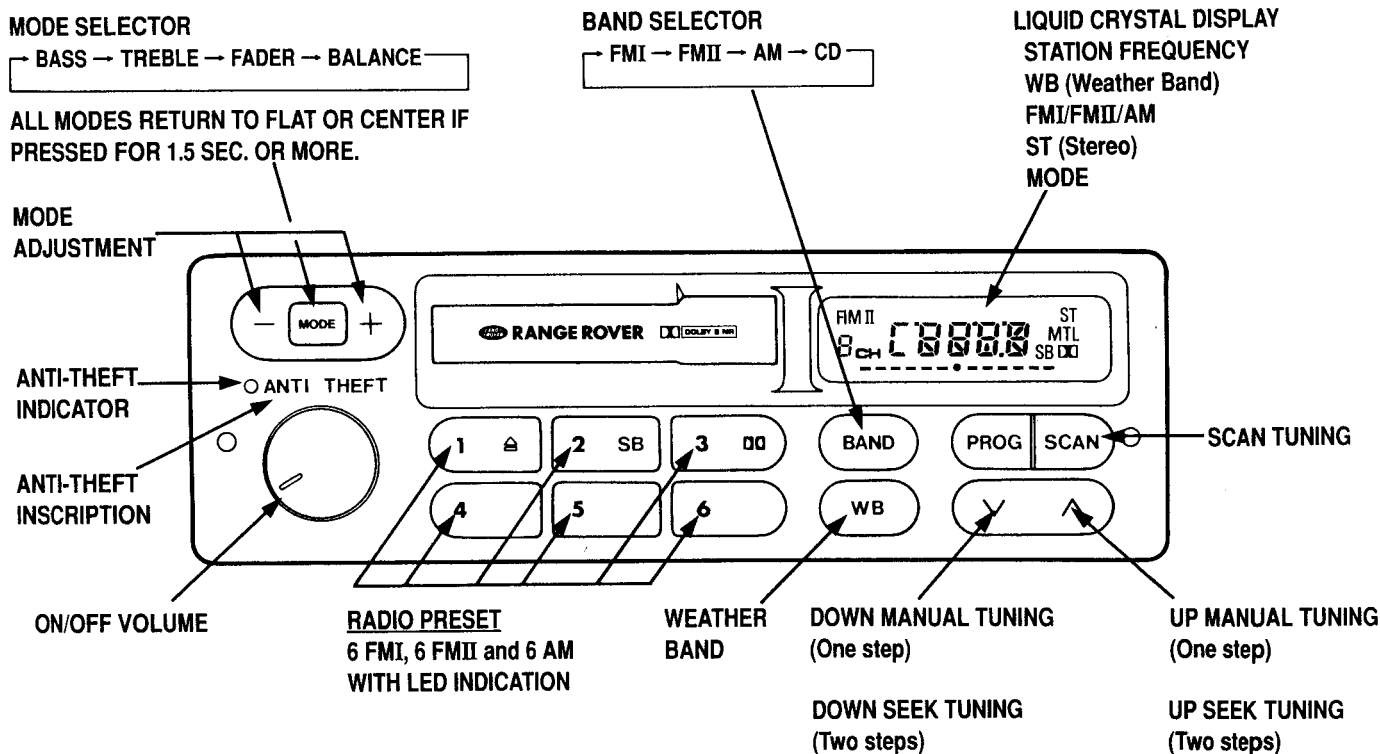
Fig. 4

3. FEATURE DESCRIPTIONS

- Anti-theft microprocessor system.
- Digital phase-locked loop frequency synthesizer automatically tunes and locks onto the broadcast frequency indicated on the frequency display.
- Automatic tape equalization (70 μ sec. or 120 μ sec.).
- Liquid crystal display.
- Separate bass, treble, fader and balance control.
- Seek tuning for radio.
- Up-scan tuning for radio.
- Programmable memory for 12 FM (6 each for FMI and FMII) and 6 AM stations.
- Weather band with seek tuning capability.
- Ignition-key-off pause mode for tapes.
- Maintenance indication for tape deck (every 15 hours of use).
- Dual function buttons for radio preset and tape operation.
- Electronic tuning.
- Power loading/soft eject.
- Automatic local/distance attenuation.
- Dolby® * B noise reduction for tape.
- Auto reverse at end of tape.
- Tape skip blank.
- Tape scan.
- Built-in automatic tape slack canceller (ATSC).
- Rotating tape head.
- Automatic Loudness control.
- Telephone muting. (Optional)

*Dolby® is a registered trademark of Dolby Laboratories, Inc.

4. RADIO MODE CONTROL LOCATION AND OPERATION



OPERATING THE RADIO

FM/AM

Press the BAND button and FMI, FMII, AM or CD will appear on the display indicating which band is being received. When FMI, FMII or AM is chosen, the currently tuned frequency is also displayed. Press the button to change from band to band.

AUTOMATIC WEATHER BROADCAST SELECTION

If you want to interrupt what you're listening to and get a weather check, just press the WB button. The WB indicator will go on, and the radio will switch to the weather band and automatically find the strongest weather broadcast in your area. (This can take a while.) If it can't find a strong enough signal, or if there isn't a signal at all, the radio will beep, and NO and WB will flash alternately on the display. To go back to what you were listening to, press the WB button again.

MANUAL/SEEK TUNING

To tune manually or make the radio automatically seek stations, use the TUNING buttons. To manually tune up the band, press the right button in one click. To manually tune down the band, press the left button in one click. To make the radio automatically tune to the next tunable station up the band, press the right button in two clicks. To do the same thing down the band, press the left button in two clicks. When the radio starts seeking a station, SEEK appears on the display for a few moments.

STEREO

The ST indicator will light up on display whenever a stereo broadcast is received. The indicator will flash when signal strength diminishes.

AUTOMATIC LOCAL/DISTANCE SWITCHING

New electronic circuitry automatically selects the local/distance mode for best reception, eliminating the need for manual switching.



SCAN TUNING

To browse through the band until you find a station you like, press the SCAN button. The SCAN indicator will go on for a few moments, and the radio will automatically hop from station to station up the band, pausing for seven seconds at each. Weak stations will be skipped over. When you hear a program you want to listen to, press the SCAN button again to stop the scan and stay on that station.



FM RECEPTION

Signal reflections or blockages caused by hills or tall buildings may cause hissing and fluttering noises in FM reception. FM signal strength diminishes beyond 25 miles from the transmitter.



PRESET STATIONS

To listen to a station whose frequency you've preset in the radio's memory, just press the appropriate PRESET button. The display will show the preset memory number (e.g., 3 CH) of the station you've selected.



PROGRAMMING/REPROGRAMMING PRESET STATIONS

Tune in the desired radio station. Then push a PRESET selection button for 1.5 seconds. When you hear a beep, the frequency has been memorized. Repeat this procedure for the remaining preset station selectors on the FM (FMI and FMII) and AM bands.

NOTE: The radio programming controls have triple functions. Each button can be set to one FMI, one FMII and one AM station.

BASS, TREBLE, FADER AND BALANCE CONTROL

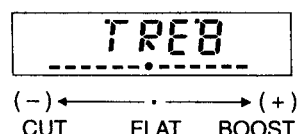
Each time the MODE button is pressed, control of bass, treble, fader, or balance is selected in turn. The selected mode is shown on the display and can be adjusted by the + and - buttons. About five seconds after adjustment, the display returns to its previous state.

When the MODE button is pressed continuously for more than 1.5 seconds, the level of each mode returns to flat or center. At this time a beep is sounded and "FLAT" is displayed on the display.

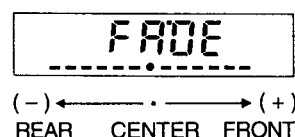
BASS



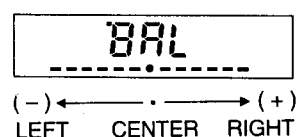
TREBLE



FADER



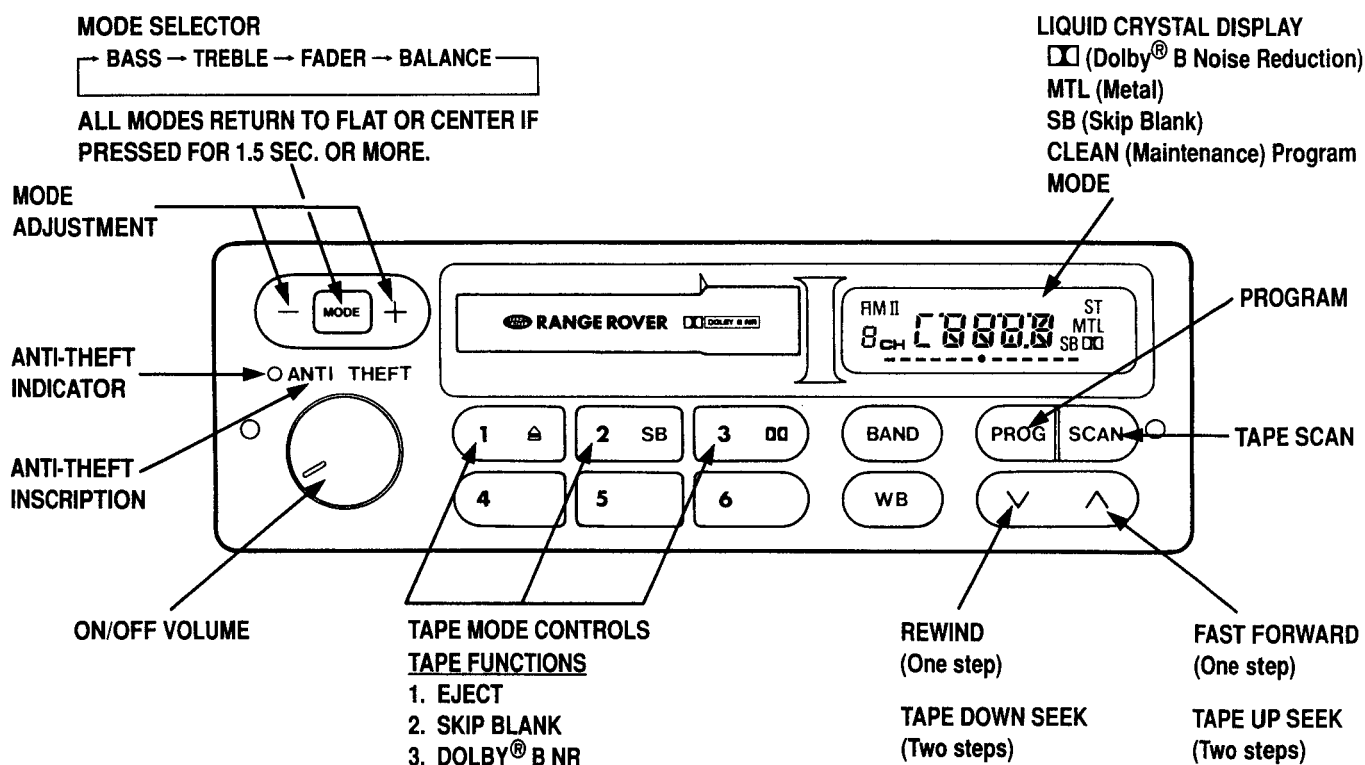
BALANCE



MUTING DURING A PHONE CALL (OPTIONAL)

If you have a cellular phone with car audio muting in your Range Rover, when a call comes in, TEL will appear on the display, and the car audio volume will be automatically turned down, and if you are listening to the cassette or compact disc player, it will automatically pause. When you hang up, the car audio will carry on as before.

5. TAPE MODE CONTROL LOCATION AND OPERATION



OPERATING THE CASSETTE PLAYER

CASSETTE OPERATION

To use the cassette player, turn the radio on. When a cassette is inserted, the unit will switch automatically from radio to tape mode.

FAST FORWARD/REWIND

The fast forward/rewind button has a two-step operation. Press the right side of button one step to fast forward; press the left side of button one step to rewind. Repeat the same action to stop the appropriate function. The logic circuitry in your radio will automatically determine the right direction for fast forward or rewind. While the tape is fast forwarding, the display shows FF; while the tape is rewinding, it shows RW.

A standard cassette has two sides and can be played in either direction. When in play, the top side of a cassette will be indicated as "1" on the display. The bottom side will appear as "2".

TAPE SEEK

Pressing the fast forward/rewind button two steps (as far as it will go) activates the seek mode. SEEK will appear on the display. To move to the next selection on your tape, press the right side of button (as far as it will go). The tape will move rapidly to the next selection. To restart the current selection, press the left side of button in the same manner.

Tape Seek will only function correctly if there are four seconds of silence between selections on your tape. Excessive noise between selections on poorly recorded tapes may interfere with these functions.

The cassette automatically ejects from the unit if tape setting operations cannot be completed within a few seconds. This may be caused by a faulty or damaged cassette. Determine the cause of the problem or use a different cassette.

REVERSING TAPE DIRECTION

To reverse tape direction, push the PROG button. The tape will reverse automatically when a side complete.



TAPE SCAN

If you wish to scan through the tape until a desired selection is found, press the SCAN button. Each selection on the tape will play for approximately 13 seconds. (The display will show SCAN.) Scanning stops when the SCAN button is pressed again.



AUTOMATIC EQUALIZATION

The playback equalization of normal tapes differs from that of chrome and metal tapes. When a high-bias tape, including metal, is inserted, the unit will automatically change to the correct equalization level, and MTL will be indicated on the display.



TAPE EJECT (1 ▲)

Press the EJECT button -1 ▲- to eject tape cassette and return to the radio mode.



SKIP BLANK (2 SB)

The SKIP BLANK button -2 SB- automatically advances the tape to the next recorded portion when a blank section exceeds approximately 15 seconds. When there is a long, unrecorded portion at the end of the tape, the unit advances the tape to the end and then starts to play the other side. When the SKIP BLANK button is pushed, SB will appear on the display. Additionally, SEEK will be displayed while the tape is advancing.



DOLBY® B NOISE REDUCTION (3 □□)

Use the Dolby® B Noise Reduction function button -3 □□- to reduce the level of hiss on Dolby® B-encoded cassettes. If you do not use the Dolby® B noise-reduction function with Dolby® B encoded tapes, the high-frequency response will be intensified. If you do use this function with non-encoded tapes, high-frequency response will be diminished.

*The word "Dolby" and the double-D symbol are registered trademarks of Dolby Laboratories, Inc.

IGNITION-KEY-OFF PAUSE MODE

If the ignition is turned off while a tape is playing, the unit automatically enters the pause mode. The unit will return to normal play mode when the ignition is turned on. The unit will not accept another cassette when it is in the pause mode.



AUTOMATIC TAPE SLACK CANCELLER (ATSC)

The automatic tape slack canceller removes any slack in the tape before play to protect the tape and extend its life.



ROTATING TAPE HEAD

The rotating tape head in your tape cassette player ensures accurate horizontal tape alignment in both directions for optimum sound level reproduction and frequency response.

NOTE: *The Range Rover Anti-Theft Radio contains a full-logic computer-controlled 3-motor drive which controls the automatic tape slack canceller (ATSC) and rotating tape head mechanism. During cassette tape loading/unloading or tape transport directional changes, the motor drive emits a precision mechanical sound which indicates normal tape cassette player operation.*

PRECAUTIONS

1. Always remove cassette from unit when it is not in use.
2. Protect your tapes by keeping them in a cassette holder. Do not expose them to heat, dust, dirt or strong magnetic sources such as electric motors or television sets.
3. Make sure there is no slack in your tape before you insert it into the unit. A loose tape can damage the unit and/or the tape itself. Loose tape can be tightened by inserting a pencil or similar instrument into the spindle hole and turning it until the tape is no longer slack.
4. Use only high-quality cassettes. 90- or 120-minute tapes are not recommended because their thickness may not accommodate the variations in vehicle interior temperatures.
5. Prevent foreign objects from entering the cassette loading slot as they can damage the precision mechanism and tape heads.

CLEANING THE CASSETTE PLAYER MECHANISM

By the time the cassette player has clocked up 15 hours of operation, the head, capstans, and pinch rollers will be getting dirty. To warn you about this, the player will beep when it hits the 15-hour mark, and HEAD and CLEAN will flash alternately on the display. Eject the cassette you're listening to as soon as it is safe or convenient (HEAD and CLEAN will stop flashing), and load a cleaning cassette. Make sure you know how to use the cleaning cassette before you do this. If you notice the sound reproduction is getting bad, use your cleaning cassette straight away; don't wait for the 15-hour warning.

Clean heads and capstans by inserting a good quality head-cleaning cassette into the tape-loading slot, and allowing it to run for approximately 40 seconds. Push the program selector to engage the second capstan and pinch roller for an additional 40 seconds.

NOTE: Make sure SKIP BLANK function is disengaged before inserting the head-cleaning cassette. Head-cleaning cassette will not work properly if SKIP BLANK function is not disengaged, resulting in insufficient cleaning of the play back heads and capstans.

MODIFICATIONS

This unit is designed as part of an integrated audio system. The installation of alternative or additional audio components may cause damage which **will not be covered by your vehicle warranty.**

OPERATING THE CD PLAYER

CD OPERATION

To use the CD player, turn the radio on and press the BAND button. The display indicates FMI, FMII, AM or CD. Select CD to switch from radio mode to CD mode.

DIRECT DISC SELECTION

DIRECT DISC SELECT buttons 1 through 6 correspond to the magazine tray numbers. When there is a disc in a tray, the number lights on the corresponding button. To play a disc in the magazine, press one of the buttons whose indicator is lit.

NOTE:

- Nothing will happen if you press a button whose indicator is not lit. The display will read "NO" for approximately 10 seconds.
- When a disc is selected there is a short pause before playback begins. The changer is returning the previous disc to the magazine and loading the selected disc.

FAST FORWARD/REVERSE

The fast forward/reverse button has a two-step operation. Press the right side of button one step to fast forward; press the left side of button one step to reverse. During the fast forward operation, the display shows FWD; during the reverse operation, it shows REV.

TRACK SEARCH

Pressing the fast forward/reverse button two steps (as far as it will go) activates the track search mode. To advance to the next track, press the right side of button (as far as it will go). To return to the previous track, press the left side of button in the same manner. Push and hold the button down (as far as it will go) to move forward or backward through the tracks.

MUSIC SCAN (HIGHLIGHT SCAN)

When the SCAN button is pressed, the word "SCAN" appears on the display and tracks will be played one after another for approximately 10 seconds, starting one minute from the beginning of each track. Press the button again when you find a track you want to listen to: the player will return to normal playback and continue with the current track.

RANDOM PLAY

Press the PROG button for random play. (RND appears on the display.) This function randomly plays one track after another, choosing from all the tracks on all the discs in the magazine randomly. Press the PROG button again to cancel random play.

NOTE: Since tracks are selected at random, it is possible that the same track may be played twice in succession.

MAGAZINE CHECK

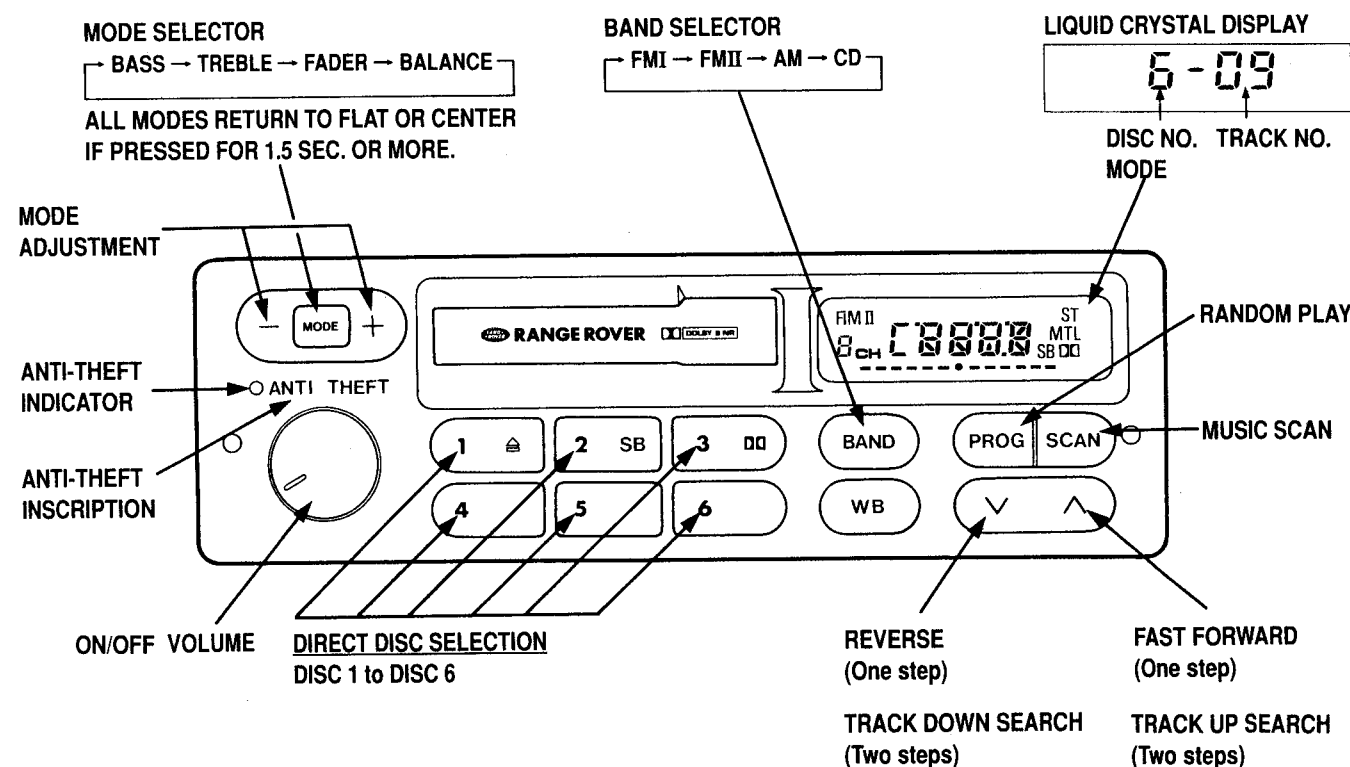
When there is no magazine in the CD changer, the word "NO" appears on the display to advise you to load a magazine.

NOTE: After you load a magazine, there is a short pause before playback begins. The changer is checking each of the discs in the magazine. (The display indicates "LOAD".)

DISC CHECK

An "Err" indication is shown on the display and operation of the system becomes impossible when there are no discs in the magazine or when the discs are loaded into the magazine with their labels facing upwards. Whenever this message appears, remove the magazine and check the discs.

6. CD MODE CONTROL LOCATION AND OPERATION



7. BLOCK DIAGRAM

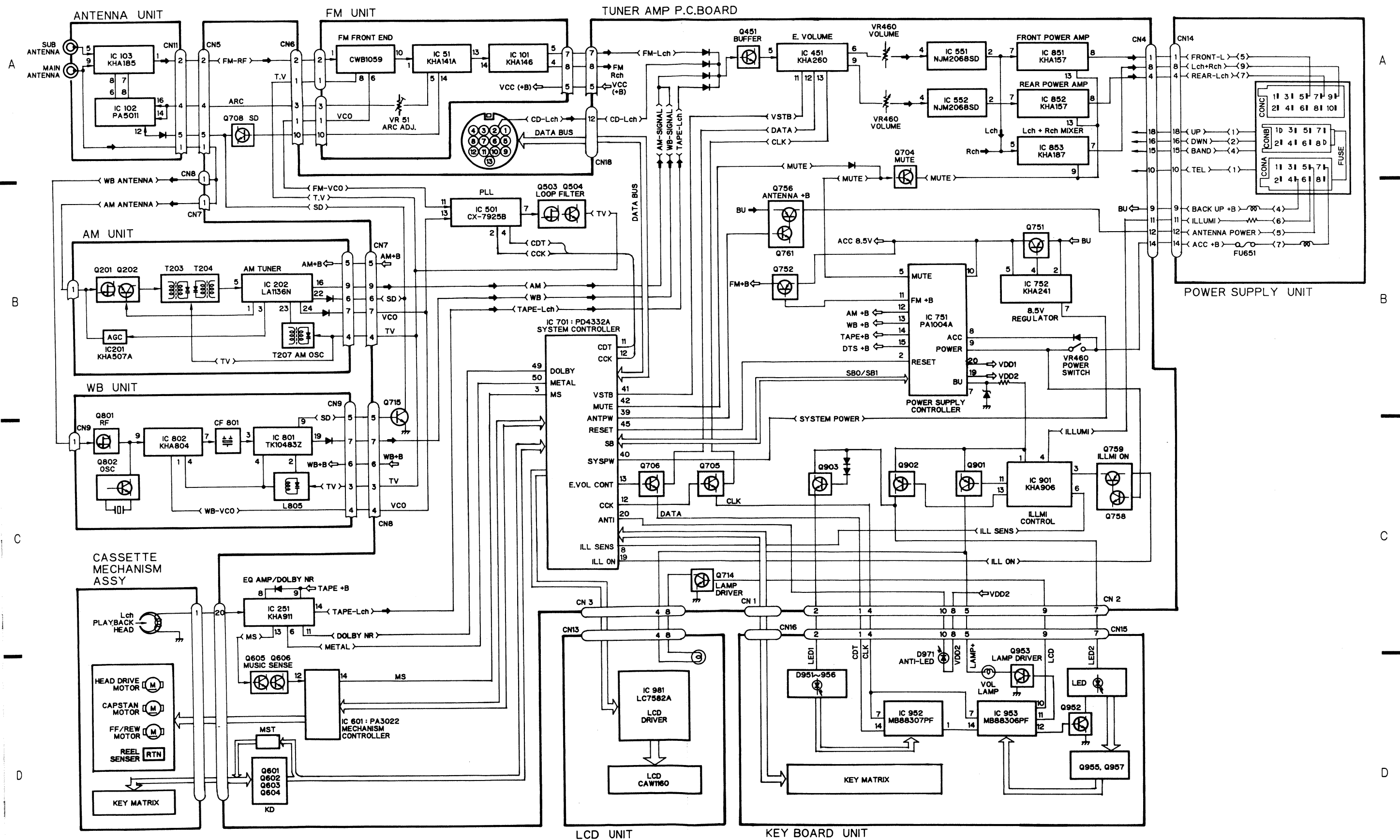
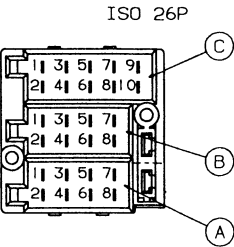
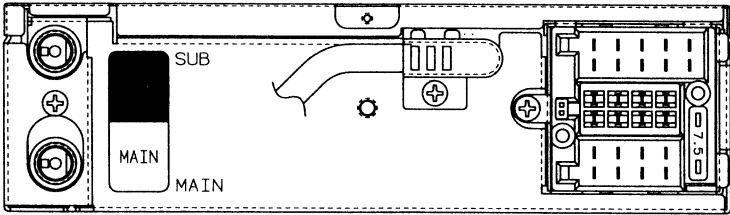


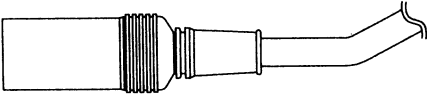
Fig. 5

8. CONNECTOR FUNCTION DESCRIPTION

PIN NO.	
1	L.CH ISO GND
2	CD L.CH
3	R.CH ISO GND
4	CD R.CH
5	GND
6	GND
7	ACC
8	D.GND
9	BSRO
10	BRST
11	BRXEN
12	DATA
13	BSCK
E	SHIELD GND



DIN 13P



PIN NO.	CON. A	CON. B	CON. C
1	TEL	UP	RR
2	NC	DOWN	RR.GND
3	NC	SEEK	FR
4	B.UP	BAND	FR.GND
5	ANT.PW	D.GND	FL
6	ILL	NC	FL.GND
7	ACC	NC	RL
8	GND	NC	RL.GND
9	—	—	SUB.W
10	—	—	W.GND

Fig. 6

9. ADJUSTMENT

9.1 TEST MODE

Test mode is mainly used in adjustment of CD multi-player.

- Switching to test mode
While pressing the BAND, 3 Keys together, switch the back-up ON.
- Canceling test mode
Switch the CD multi-player and KEX-910ZRV back-up OFF.
- Key functions during test mode
The CD multi-player, deck and tuner are selected by the **BAND** key.

a) CD multi-player

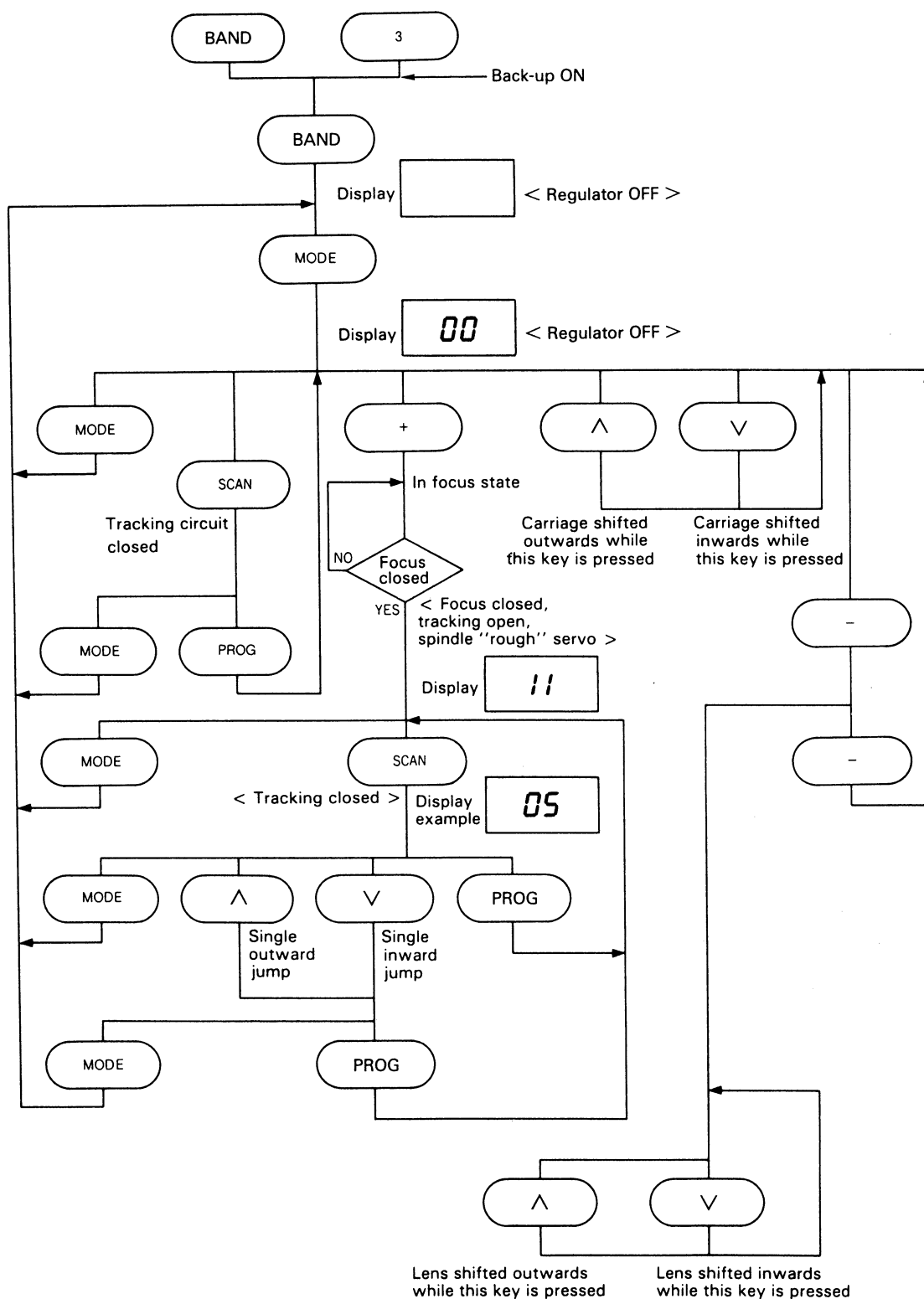
Key	Function
MODE	Regulator ON/OFF
∧	FWD kick
∨	REV kick
SCAN	Tracking close
PROG	Tracking open
+	Focus close
–	Carriage/tracking switching

NOTE:

Concerning operation in the test mode.

- (1) Continuous carriage movement is not possible by pressing the ∧ or ∨ keys. Either press the keys repeatedly or move the carriage manually.
- (2) Spindle kick is not possible during focus search. Rotate the disc manually (i.e. at first rotate it a little by hand, and then it will continue to rotate).

- **Flow Chart**



9.2 AUDIO/TUNER ADJUSTMENT

NOTICE:

Select C1 so that total capacity of 80pF is attained from the direction of the receiver jack.

Z: Output impedance of SSG.

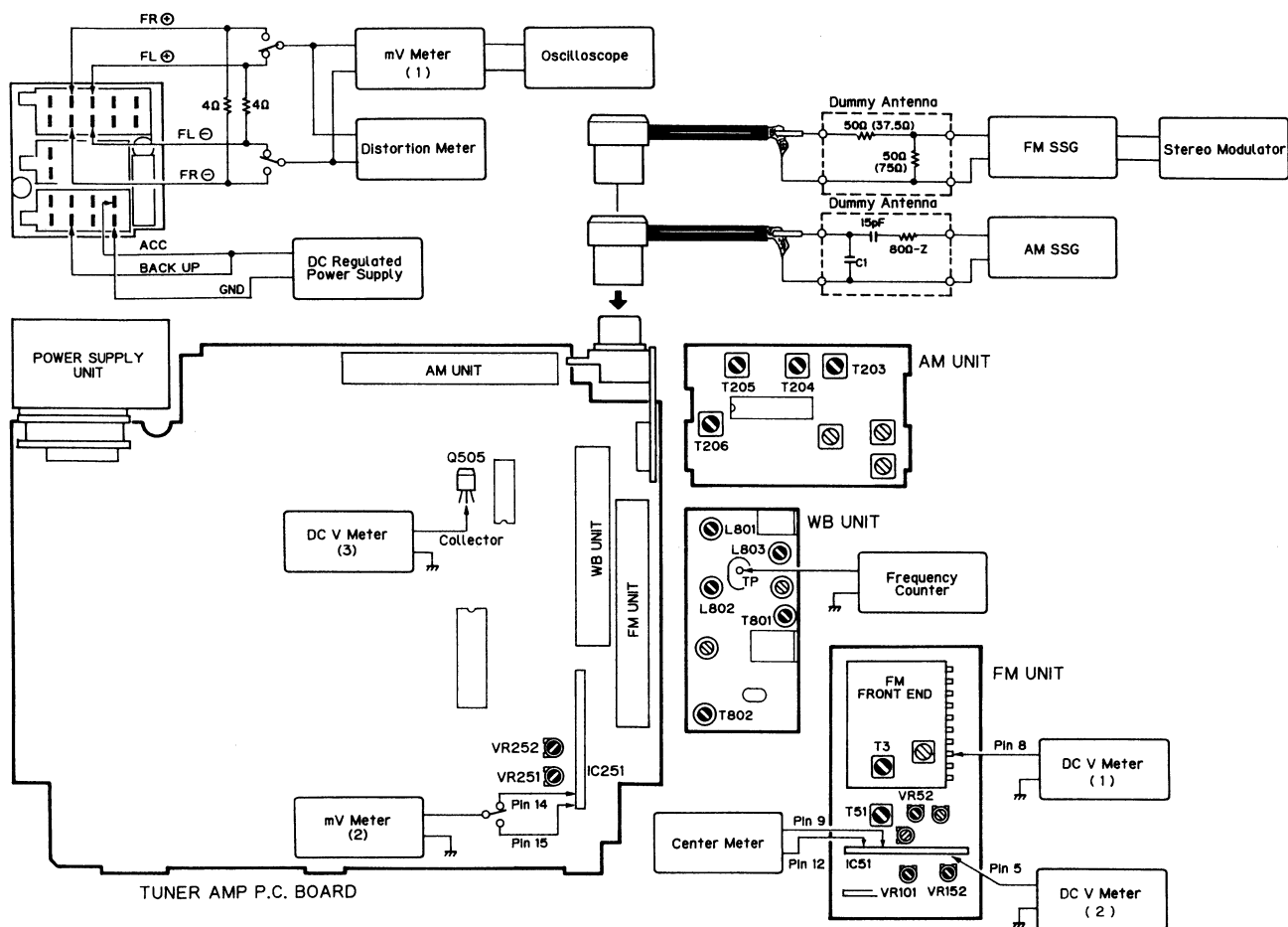


Fig. 7

FM ADJUSTMENT ※ Stereo MOD.: 1kHz, L+R=90% , Pilot=10%

	No.	FM SSG(400Hz, 100%)		Displayed Frequency (MHz)	Adjusting Point	Adjustment Method (Switch Position)
		Frequency (MHz)	Level (dB μ V)			
IF	1	98.1 Unmodulated	60	98.1	T51	Center Meter:0
Front End	1			87.7	—	Verify that DC V Meter(1) is more than 1.4 \pm 0.5V.
	2			107.9	—	Verify that DC V Meter(1) is more than 7.5 \pm 0.1V.
	3	98.1	15	98.1	T3	mV Meter(1):Maximum
ARC	1	98.1	60	98.1	VR51	DC V Meter(2):2.5 \pm 0.1V
MPX	1	※98.1	60	98.1	VR101	mV Meter(1):Separation Maximum
	2	※98.1	35	98.1	VR152	mV Meter(1):Separation 5 dB
	3	98.1	21 \pm 5	98.1	VR52	Seek stop

AM ADJUSTMENT

	No.	AM SSG(400Hz, 30%)		Displayed Frequency (kHz)	Adjusting Point	Adjustment Method (Switch Position)
		Frequency (kHz)	Level (dB μ V)			
Tuning Volt	1	1,710	—	1,710	—	DC V Meter(3):Less than 8.0V
	2	530	—	530	—	DC V Meter(3):More than 0.8V
Tracking	1	600	20	600	T203, 204, 205, 206	mV Meter(1):Maximum
	2	600 1,000 1,400	35	600 1,000 1,400	—	The difference between the maximum and minimum output levels at 600kHz, 1,000kHz and 1,400kHz must be 6dB or less.

WB ADJUSTMENT

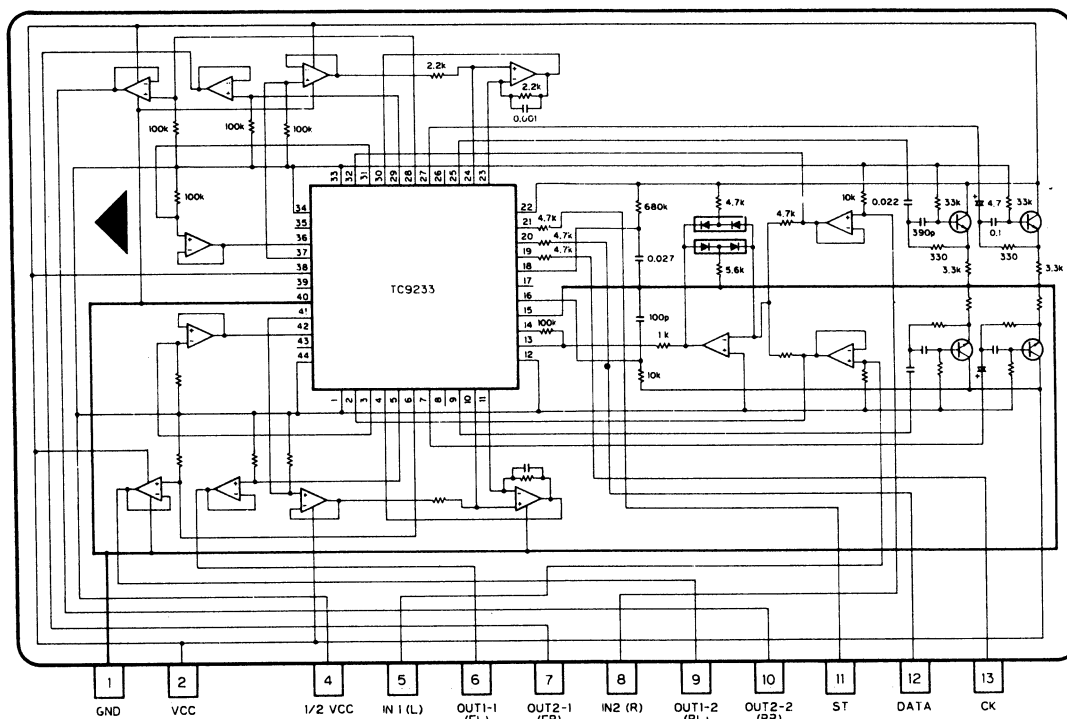
	No.	FM SSG(400Hz, 100%)		Displayed Frequency (MHz)	Adjusting Point	Adjustment Method (Switch Position)
		Frequency (MHz)	Level (dB μ V)			
	1			CH-3/WB	L803	Frequency Counter: 151.775kHz NOTE:After adjusting L803, disconnect frequency counter.
	2	162.400	60	CH-2/WB	Volume control knob	mV Meter(1):10dBs
	3	162.400	60	CH-2/WB	T802	Distortion Meter:Minimum
	4	162.475	10-15	CH-3/WB	L801, L802	mV Meter(1):Maximum
	5	162.475	10-15	CH-3/WB	T801	mV Meter(1):Maximum

DOLBY NR ADJUSTMENT

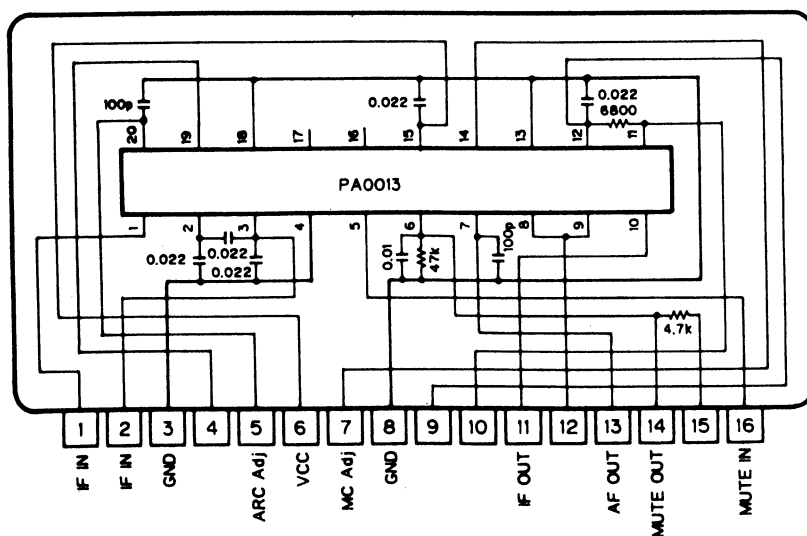
No.	Cassette Tape	Adjusting Point	Adjustment Method (Switch Position)
1	NCT-150 (400Hz, 200nwb/m)	VR251 (Lch) VR252 (Rch)	mV Meter (2) : 337mV (-7.2dBs) (DOLBY NR Switch:OFF)

• ICs

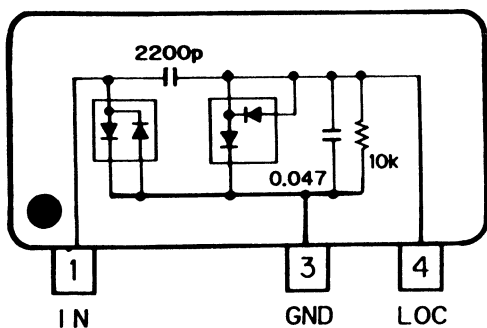
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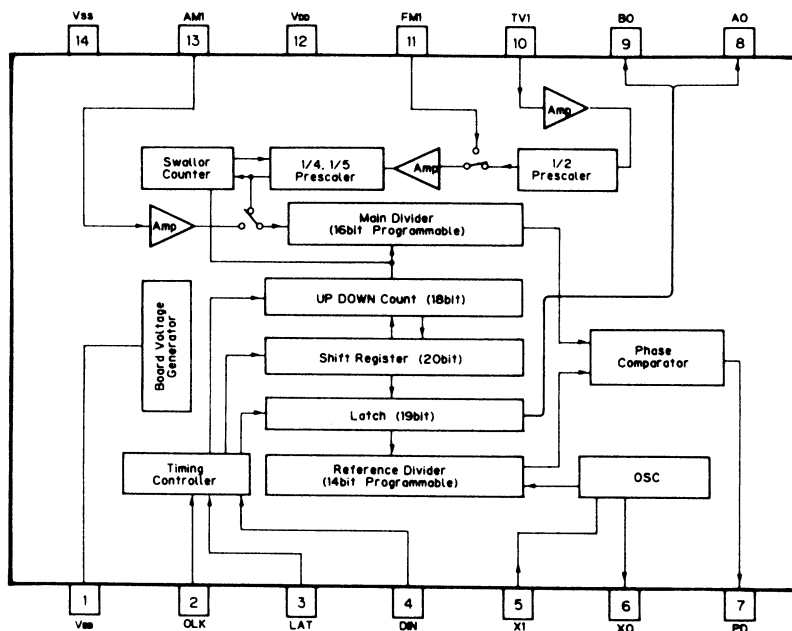
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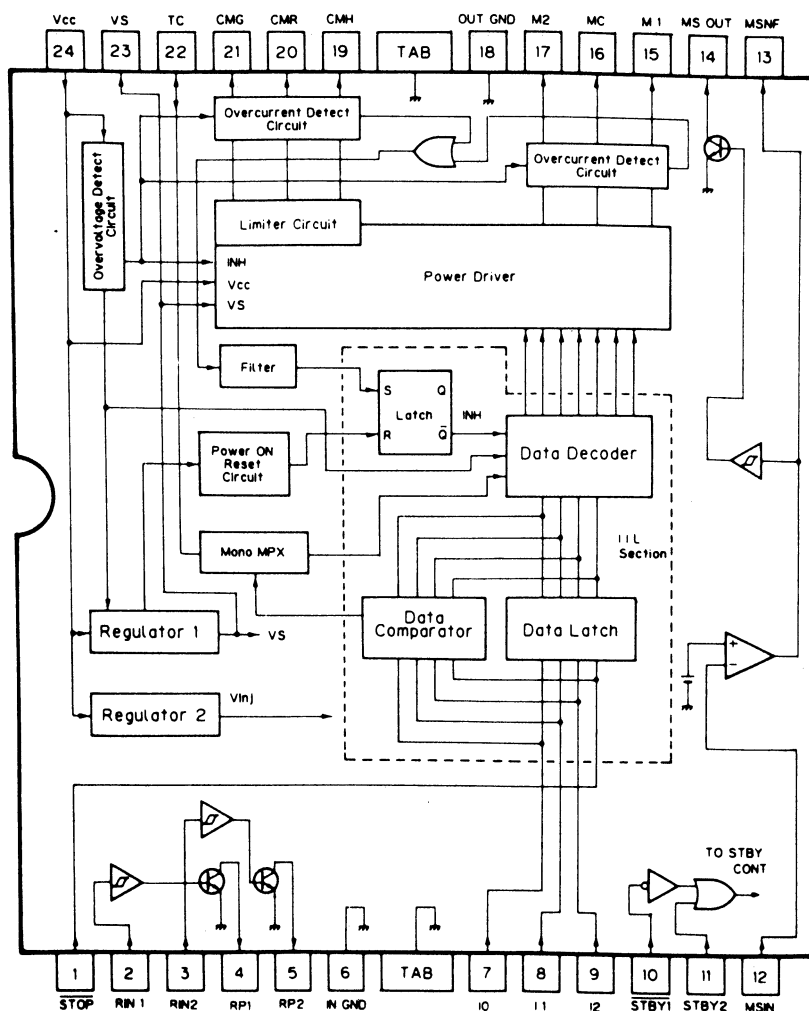
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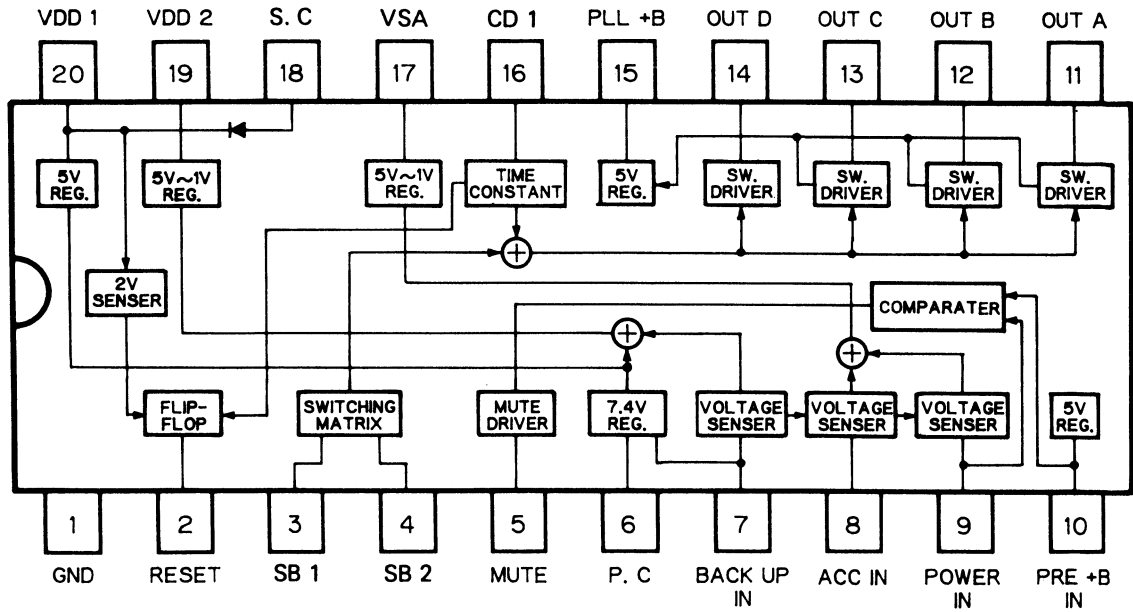
CX-7925B



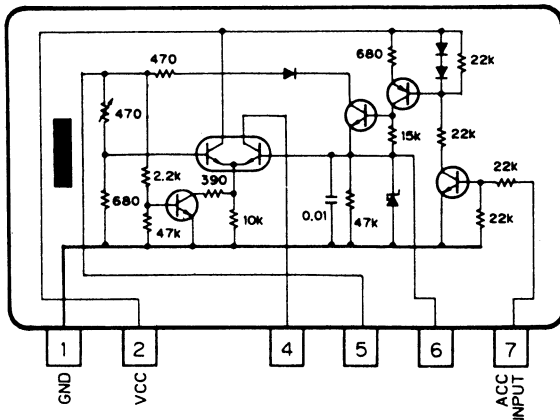
PA3022



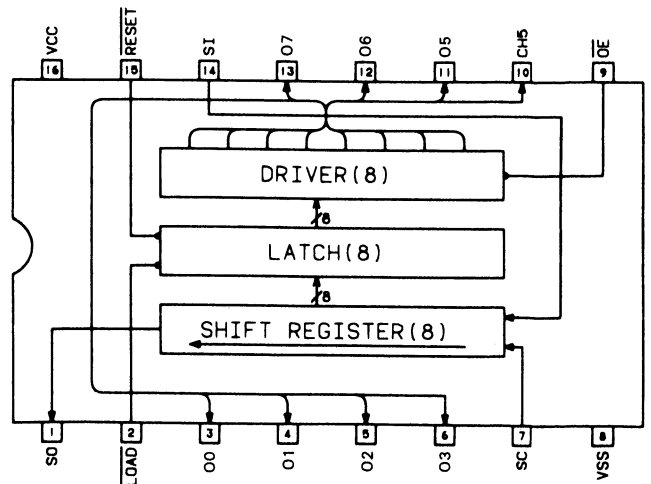
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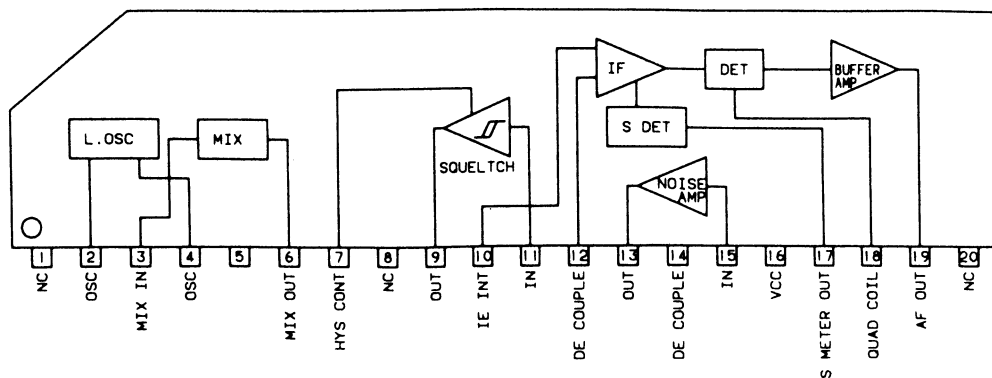
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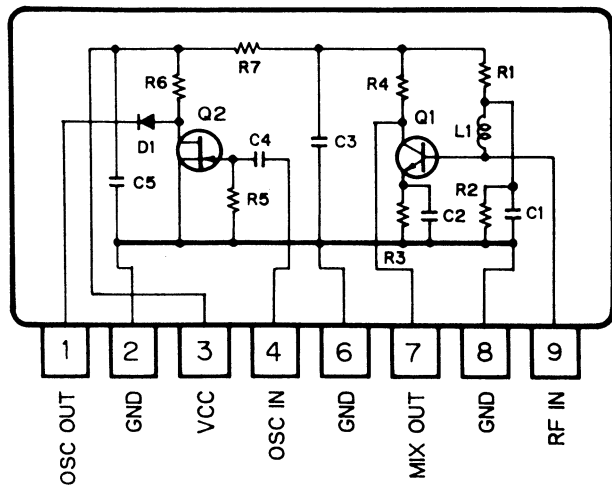
MB88307PF, MB88306PF



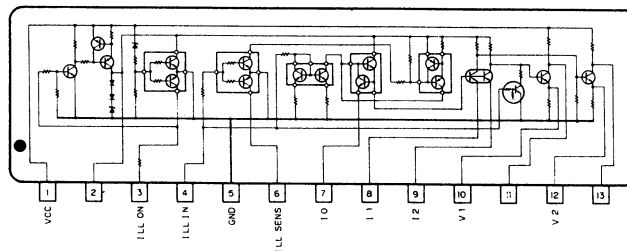
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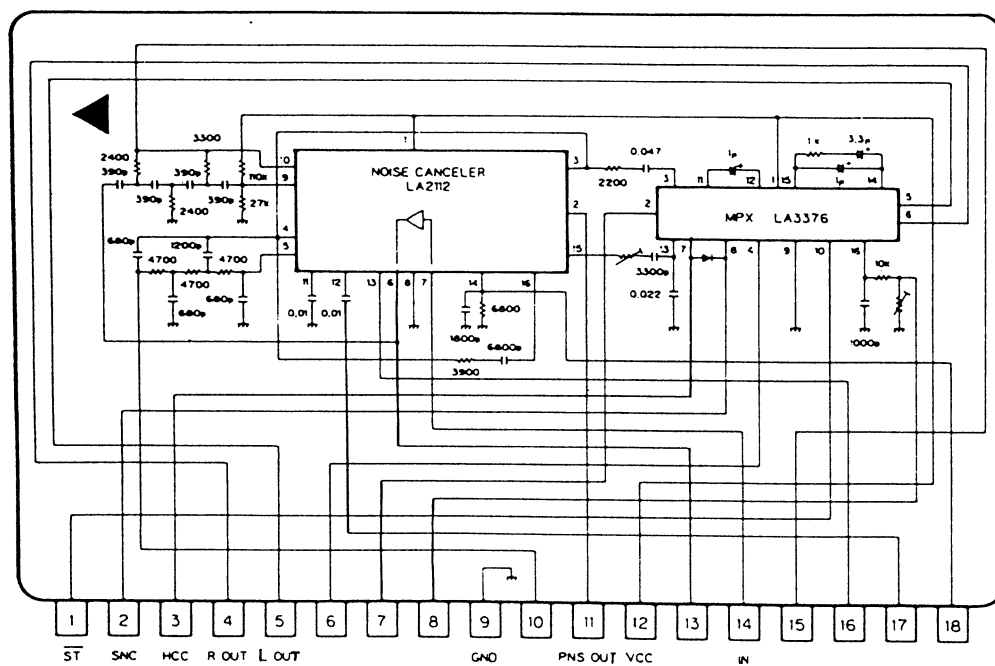
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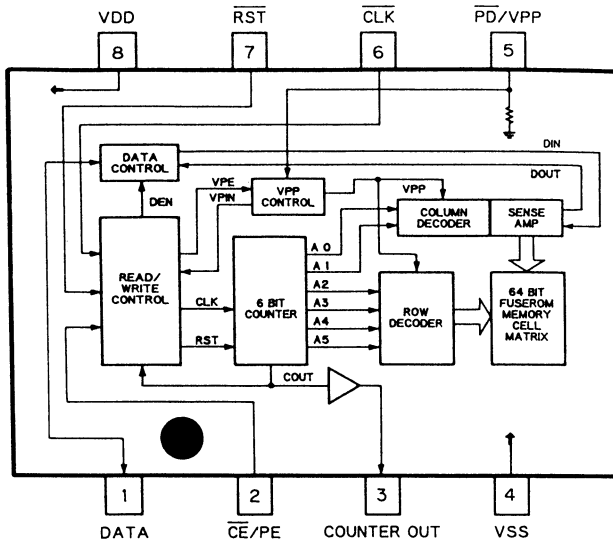
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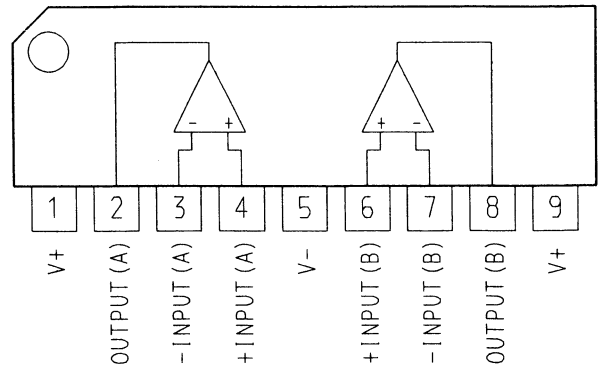
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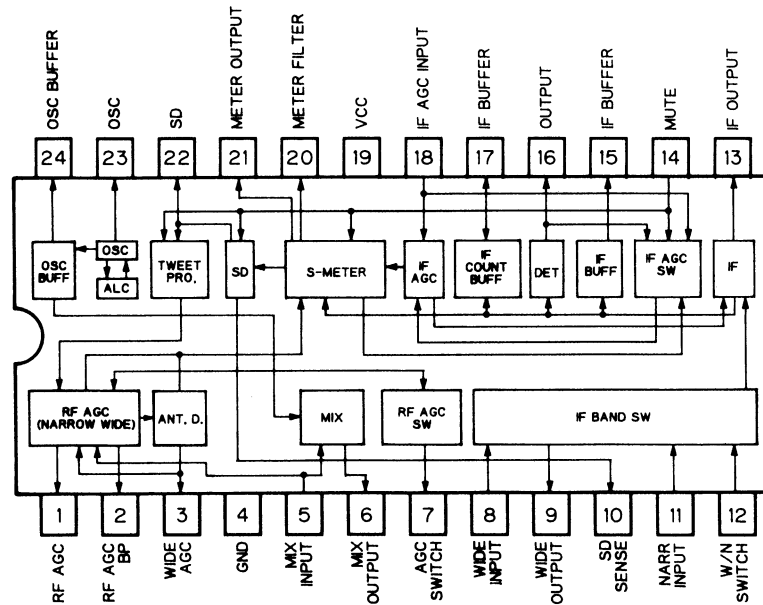
P-2100R



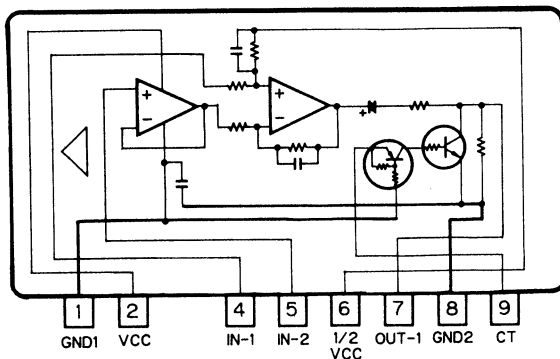
NJM2068SD



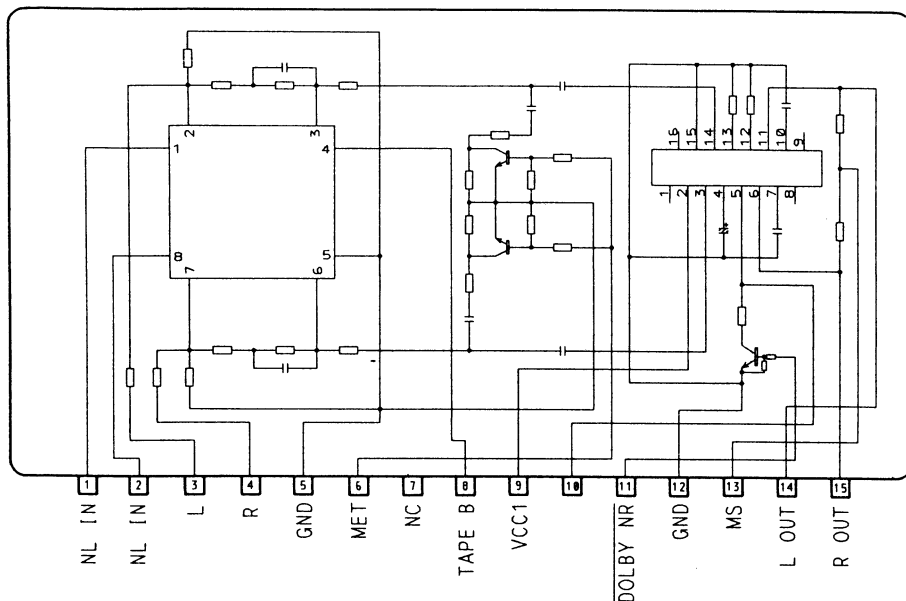
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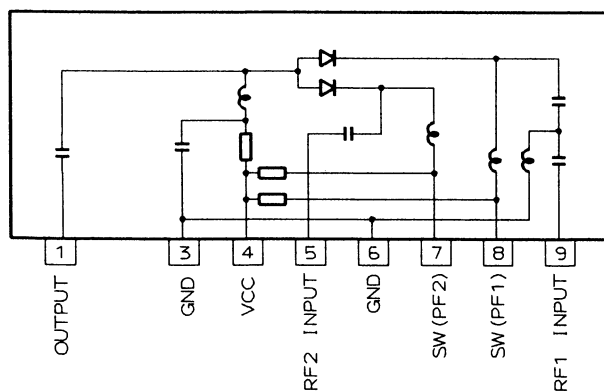
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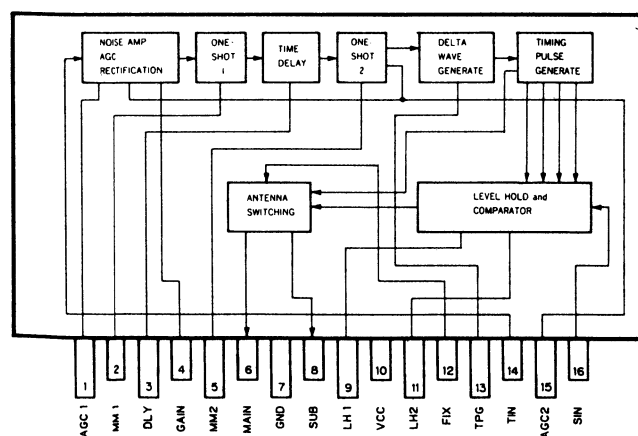
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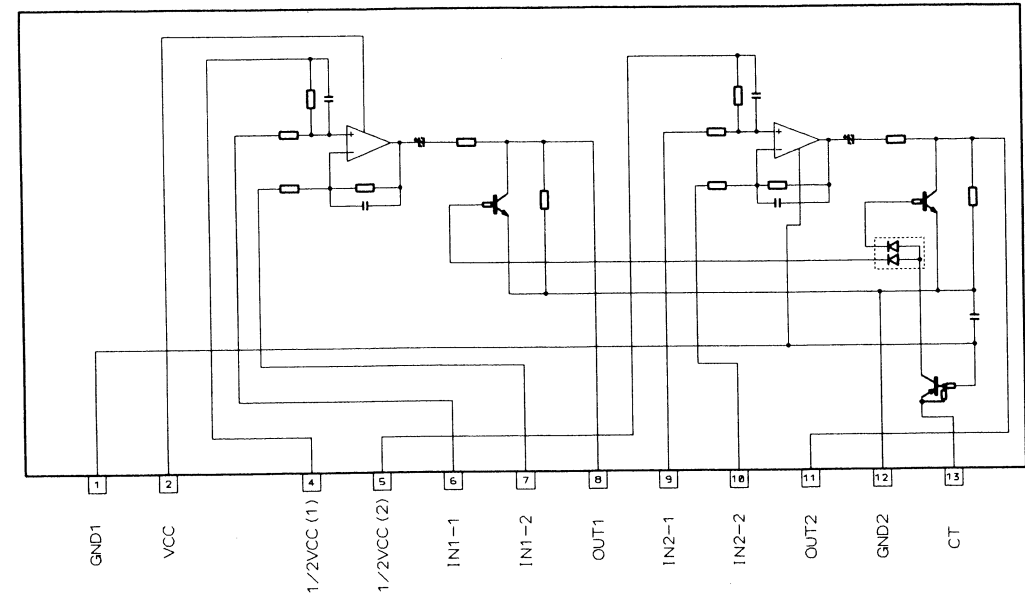
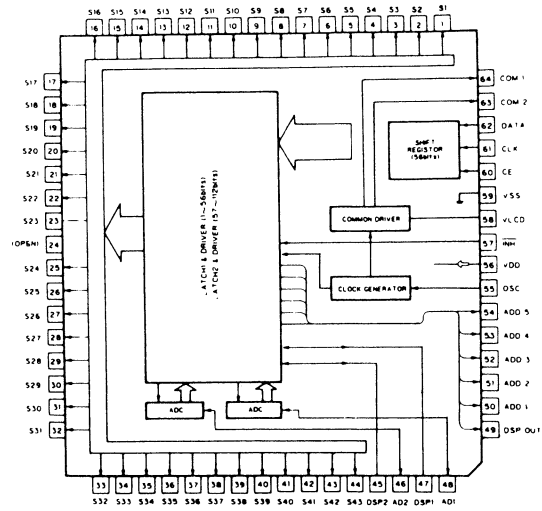


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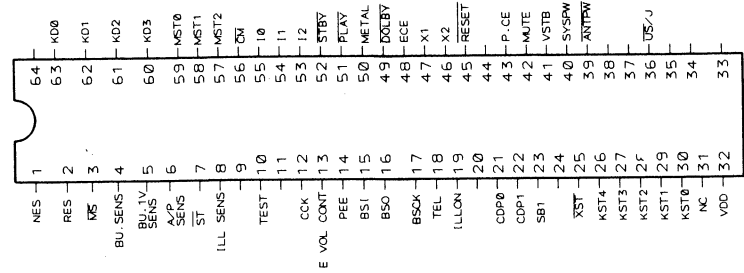


PA5011





*PD4332C



IC's marked by * are MOS type.
Be careful in handling them because they are very liable to be damaged by electrostatic induction.

● Pin Functions (PD4332C)

Pin	Pin name	I/O	Output Format	Function
1	NES	input		Normal end detect
2	RES	input		Reverse end detect
3	MS			Blank detect
4	BSENS			Back up detect
5	BUIVS			Back up 1V
6	APSENS			ACC power detect
7	ST	input		Stereo
8	ILMIN	input		Illumination input
9	EDI			EEPROM data input
10	TESTIN	input		Test mode program entry
11	CDT	output		Common data 1
12	CCK	output		Common clock
13	VDEN	output		Volume data enable
14	PEE			Beep
15	BSI	input		Bus serial input
16	BSO	output		Bus serial output
17	BSCK			Bus serial clock
18	TEL	input		Telephone mute
19	NC			
20	ANTI	output	N	Anti-LED
21	CDPW0	output	N	CD power supply control
22	CDPW1	output	N	CD power supply control
23	SB0	output	N	Power supply control
24	SB1	output	N	Power supply control
25	XST	output	N	Extension I/O LOAD
26-30	KST4-0	output	N	Key strobe
31	NC			
32	VDD			
33	BRXEN	input/output		Bus reception enable
34	BRST	output	C	Bus reset
35	SD	input/output	C	SD existence
36	MODEJ	input		Mode select
37	LINH	output	C	LCD driver inhibit
38	LCE	output	C	LCD driver chip enable
39	ANTPW	output	C	Antenna control current
40	SYSPW	output	C	System power supply
41	VST	output	C	Electronic volume strobe
42	MUTE	output	C	Mute output
43	PCE	output	C	PLL IC chip enable
44	NC			
45	RESET			
46, 47	X2, X1			
48	ECE	output	C	EEPROM chip enable
49	DOLBY NR	output	C	Dolby NR ON=L
50	METAL	output	C	70μS=H
51	PLAY	output	C	Play
52	STBY	output	C	PA3022 stand-by
53-55	I2-I0	output	C	PA3022 data
56	CM	output	C	Capstan motor
57-59	MST2-0	output	C	Mechanism switch strobe
60-63	KD3-0	input		Key , mechanism switch input
64	vss			

Output Format	Meaning
C	C-MOS
N	N channel open drain

● Pin Functions (PD4332C)

Pin	Pin name	I/O	Output Format	Function
1	NES	input		Normal end detect
2	RES	input		Reverse end detect
3	MS			Blank detect
4	BSENS			Back up detect
5	BUIVS			Back up 1V
6	APSENS			ACC power detect
7	ST	input		Stereo
8	ILMIN	input		Illumination input
9	EDI			EEPROM data input
10	TESTIN	input		Test mode program entry
11	CDT	output		Common data 1
12	CCK	output		Common clock
13	VDEN	output		Volume data enable
14	PEE			Beep
15	BSI	input		Bus serial input
16	BSO	output		Bus serial output
17	BSCK			Bus serial clock
18	TEL	input		Telephone mute
19	NC			
20	ANTI	output	N	Anti-LED
21	CDPWO	output	N	CD power supply control
22	CDPW1	output	N	CD power supply control
23	SBO	output	N	Power supply control
24	SB1	output	N	Power supply control
25	XST	output	N	Extension I/O LOAD
26-30	KST4-0	output	N	Key strobe
31	NC			
32	VDD			
33	BRXEN	input/output		Bus reception enable
34	BRST	output	C	Bus reset
35	SD	input/output	C	SD existence
36	MODEJ	input		Mode select
37	LINH	output	C	LCD driver inhibit
38	LCE	output	C	LCD driver chip enable
39	ANTPW	output	C	Antenna control current
40	SYSPW	output	C	System power supply
41	VST	output	C	Electronic volume strobe
42	MUTE	output	C	Mute output
43	PCE	output	C	PLL IC chip enable
44	NC			
45	RESET			
46, 47	X2, X1			
48	ECE	output	C	EEPROM chip enable
49	DOLBY NR	output	C	Dolby NR ON=L
50	METAL	output	C	70μS=H
51	PLAY	output	C	Play
52	STBY	output	C	PA3022 stand-by
53-55	I2-10	output	C	PA3022 data
56	CM	output	C	Capstan motor
57-59	MST2-0	output	C	Mechanism switch strobe
60-63	KD3-0	input		Key , mechanism switch input
64	VSS			

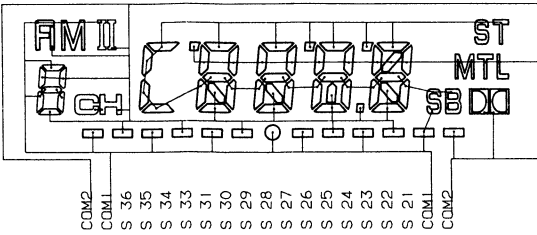
Output Format	Meaning
C	C-MOS
N	N channel open drain

use they are very tatic induction.

● LCD (CAW1160)

COMMON

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21



SEGMENT

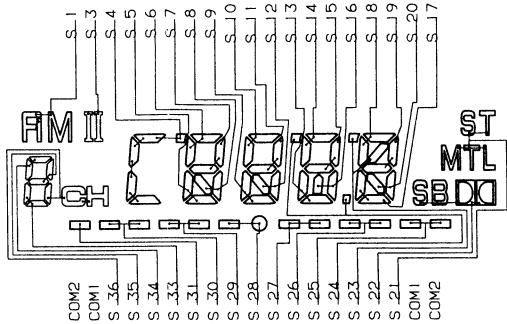
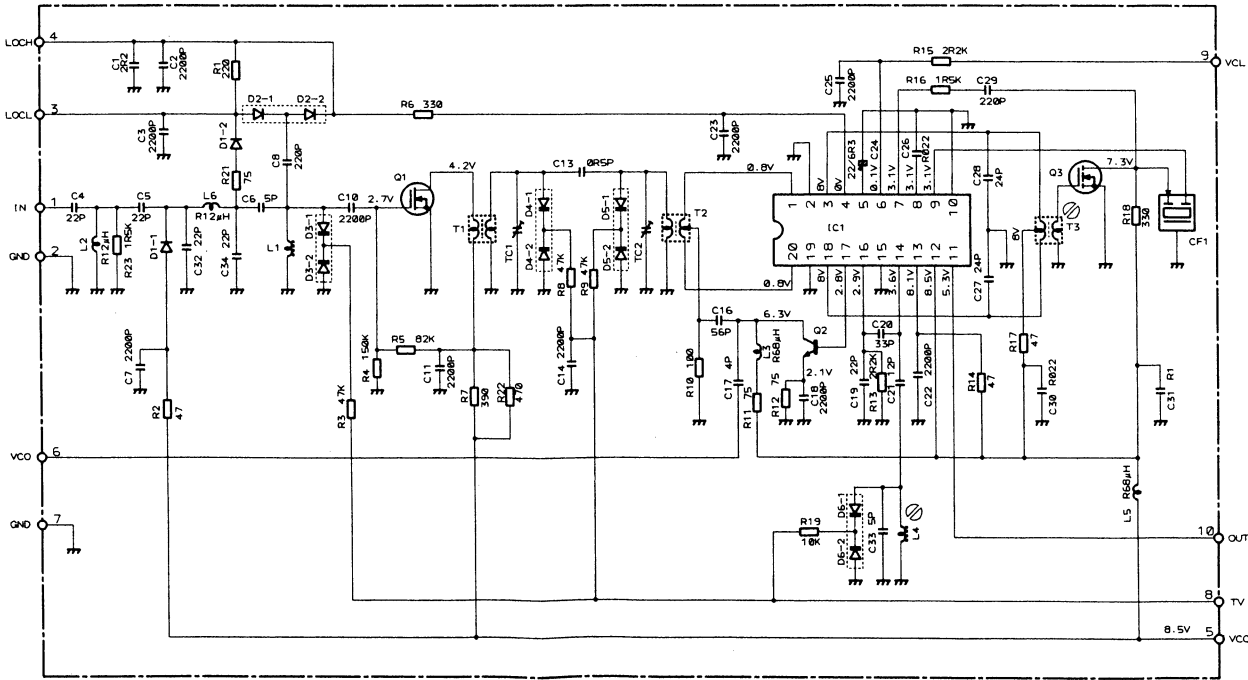


Fig. 8

● FM Front End (CWB1059)



NOTE:
□ Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.
—||— Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as:
2.2-2R2
0.022-R022

Fig. 9

10. CONNECTION DIAGRAM

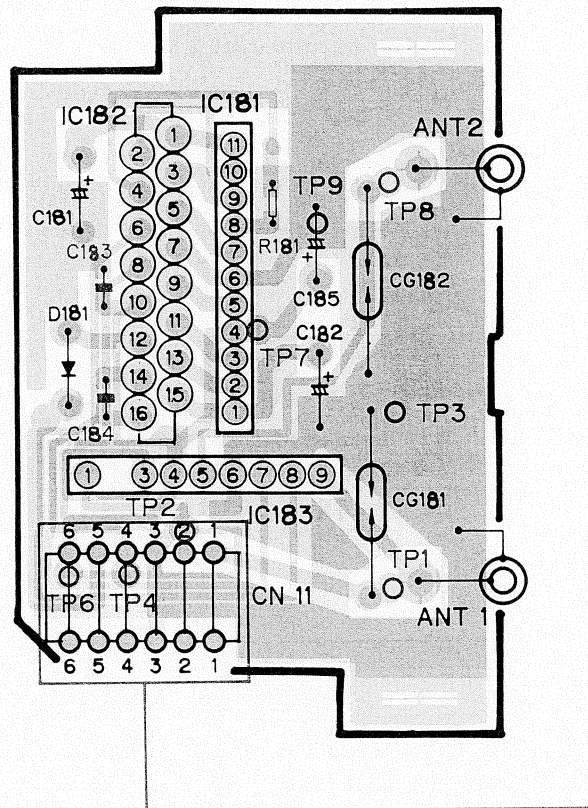
IC 181										
1	2	3	4	5	6	7	8	9	10	11
2.2V	0.2V	2.3V	8.5V	2.3V	0V	0V	3.2V	0V	0V	0.8V

ANTENNA UNIT

IC182
IC IC183 IC181

IC 182							
1	2	3	4	5	6	7	8
0.8V	0V	0V	3.2V	0V	2.0V	0V	8.5V
9	10	11	12	13	14	15	16
2.3V	8.5V	3.2V	4.3V	0.2V	3.3V	2.2V	1.2V

IC 183								
1	2	3	4	5	6	7	8	9
0V	NC	0V	8.5V	0V	0V	8.5V	2.0V	0V



TO CASSETTE MECHANISM ASSY

TO FM UNIT

TO WB UNIT CN9

TO FM UNIT

TO AM UNIT CN201

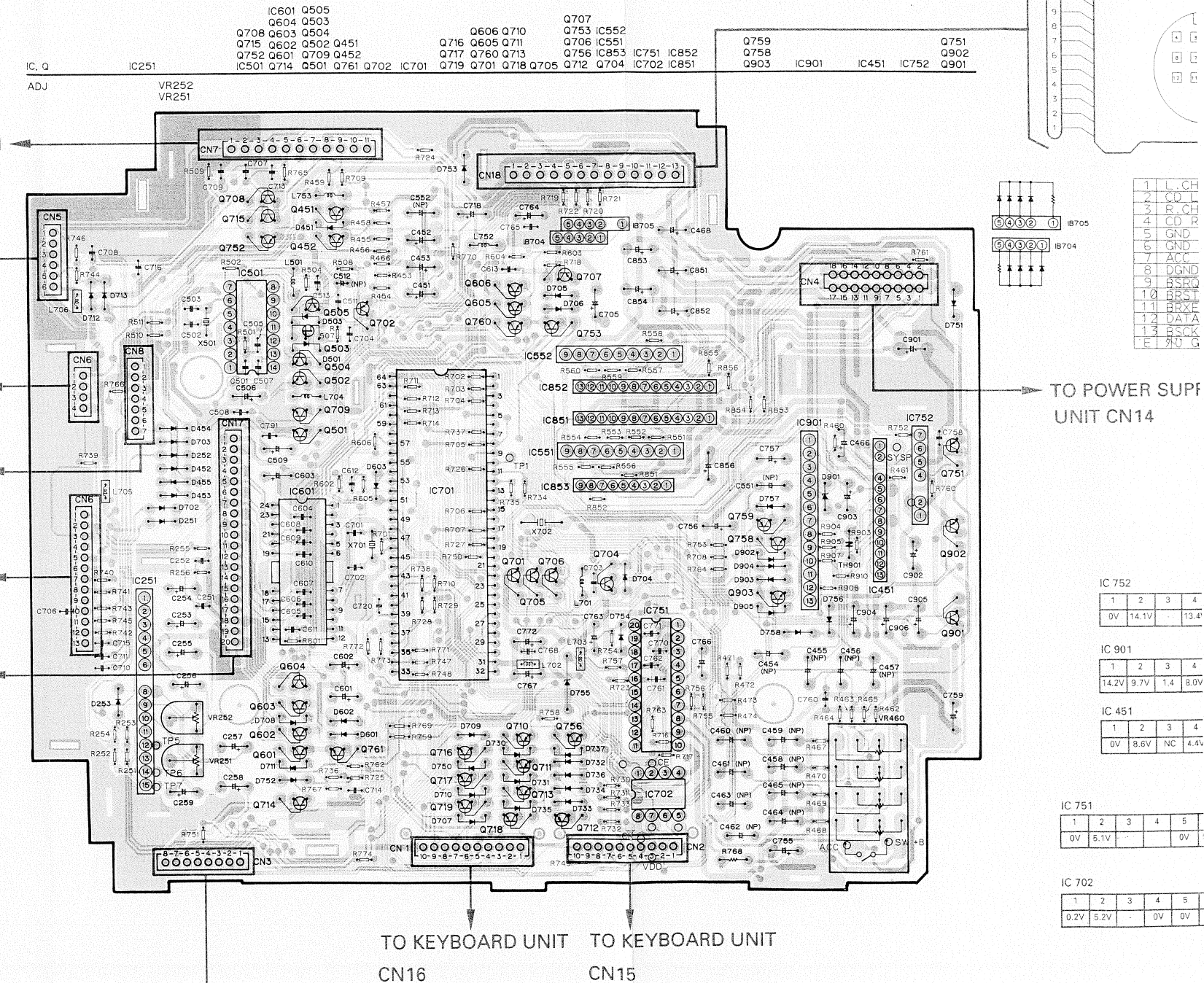
TUNER AMP P.C. BOARD

IC 501						
1	2	3	4	5	6	7
2.5V	0V	0V	0V	2.1V	1.2V	2.1V
8	9	10	11	12	13	14
5.1V	-	-	2.3V	5.1V	4.5V	0V

IC 551, 552								
1	2	3	4	5	6	7	8	9
8.6V	4.4V	4.4V	4.3V	0V	4.3V	4.4V	4.4V	8.6V

IC 851, 852												
1	2	3	4	5	6	7	8	9	10	11	12	13
0V	8.6V	-	4.4V	4.3V	4.4V	4.4V	0V	4.4V	4.4V	0V	4.4V	0V

IC 853								
1	2	3	4	5	6	7	8	9
0V	8.6V	-	4.4V	4.4V	4.4V	0V	0V	0V



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

IC 752			
1	2	3	4
0V	14.1V	-	13.4V

IC 901			
1	2	3	4
14.2V	9.7V	1.4	8.0V

IC 451			
1	2	3	4
0V	8.6V	NC	4.4V

IC 751				
1	2	3	4	5
0V	5.1V	-	-	0V

IC 702				
1	2	3	4	5
0.2V	5.2V	-	0V	0V

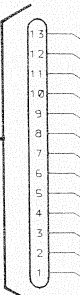
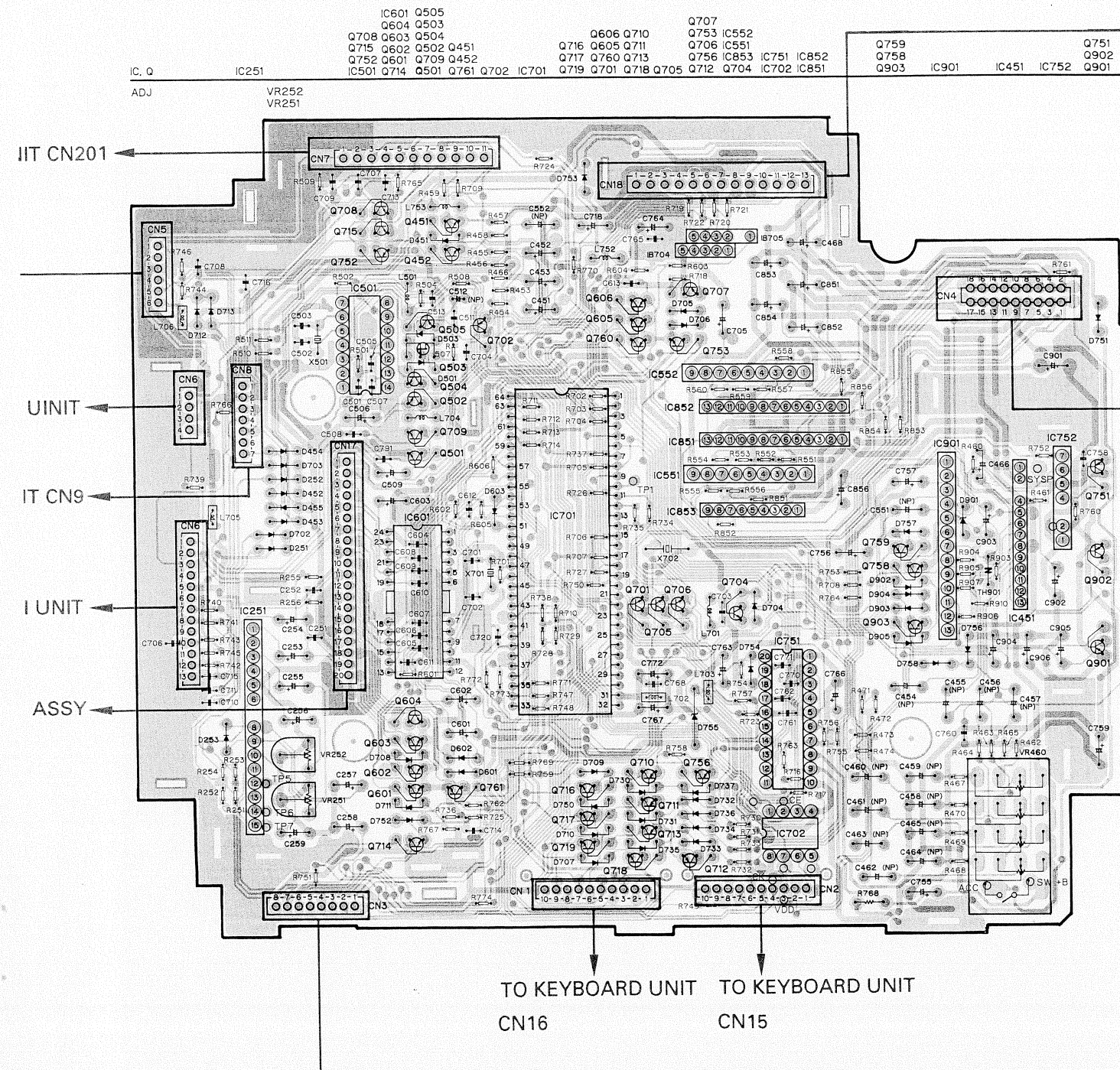
1	2	3	4	5	6	7
-2.5V	0V	0V	0V	2.1V	1.2V	2.1V
8	9	10	11	12	13	14
5.1V	-	-	2.3V	5.1V	4.5V	0V

1	2	3	4	5	6	7	8	9
8.6V	4.4V	4.4V	4.3V	0V	4.3V	4.4V	4.4V	8.6V

1	2	3	4	5	6	7	8	9	10	11	12	13
0V	8.6V	-	4.4V	4.3V	4.4V	4.4V	0V	4.4V	4.4V	0V	4.4V	0V

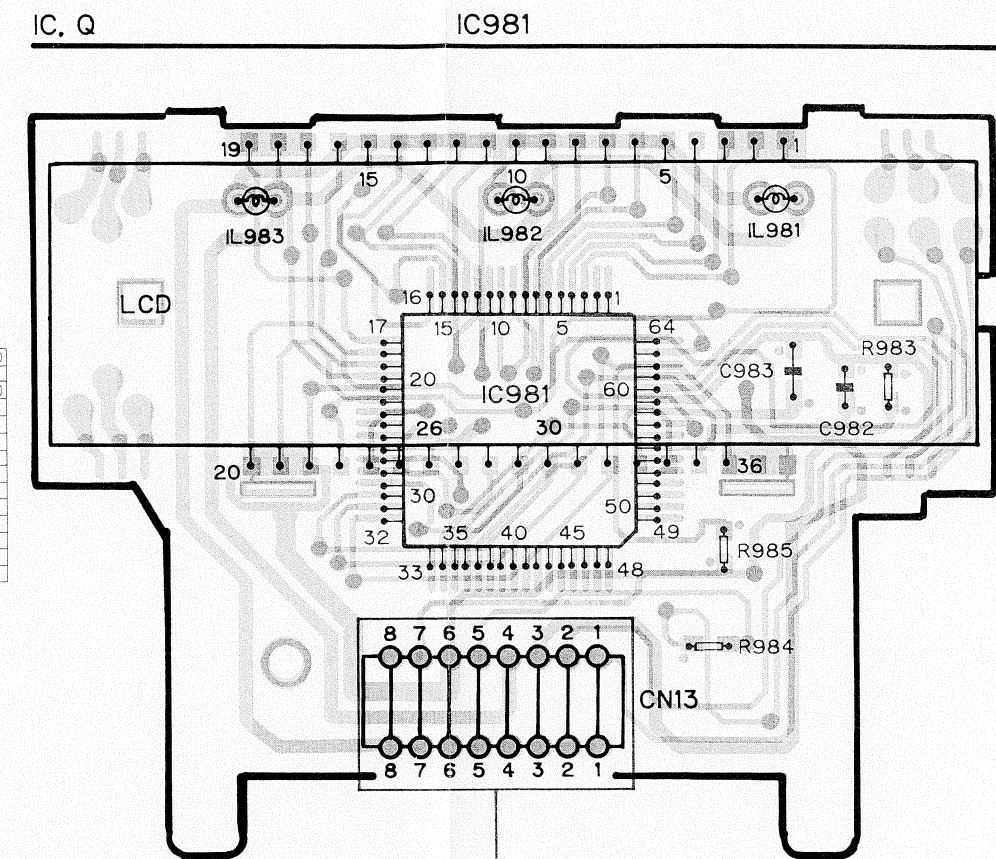
1	2	3	4	5	6	7	8	9
0V	8.6V	-	4.4V	4.4V	4.4V	0V	0V	0V

TUNER AMP P.C. BOARD



1	L.CH ISO GND
2	CD L.CH
3	R.CH ISO GND
4	CD R.CH
5	GND
6	GND
7	ACC
8	DGND
9	BSRQ
10	BRST
11	BRXEN
12	DATA
13	BCLK
14	70 GND

TO POWER SUPPLY UNIT CN14



LCD UNIT

1	2	3	4	5	6	7
0V	14.1V	-	13.4V	8.6V	5.2V	2.0V

1	2	3	4	5	6	7	8	9	10	11	12	13
14.2V	9.7V	1.4	8.0V	0V	0V	0V	0V	0V	8.1V	13.5V	8.0V	13.5V

1	2	3	4	5	6	7	8	9	10	11	12	13
0V	8.6V	NC	4.4V	4.4V	4.4V	4.4V	4.4V	4.4V	4.4V	0V	8.6V	8.6V

1	2	3	4	5	6	7	8	9	10	17	18	19	20
0V	5.1V	-	0V	9.1V	13.9V	14.3V	14.3V	8.6V	5.1V	-	5.8V	5.2V	

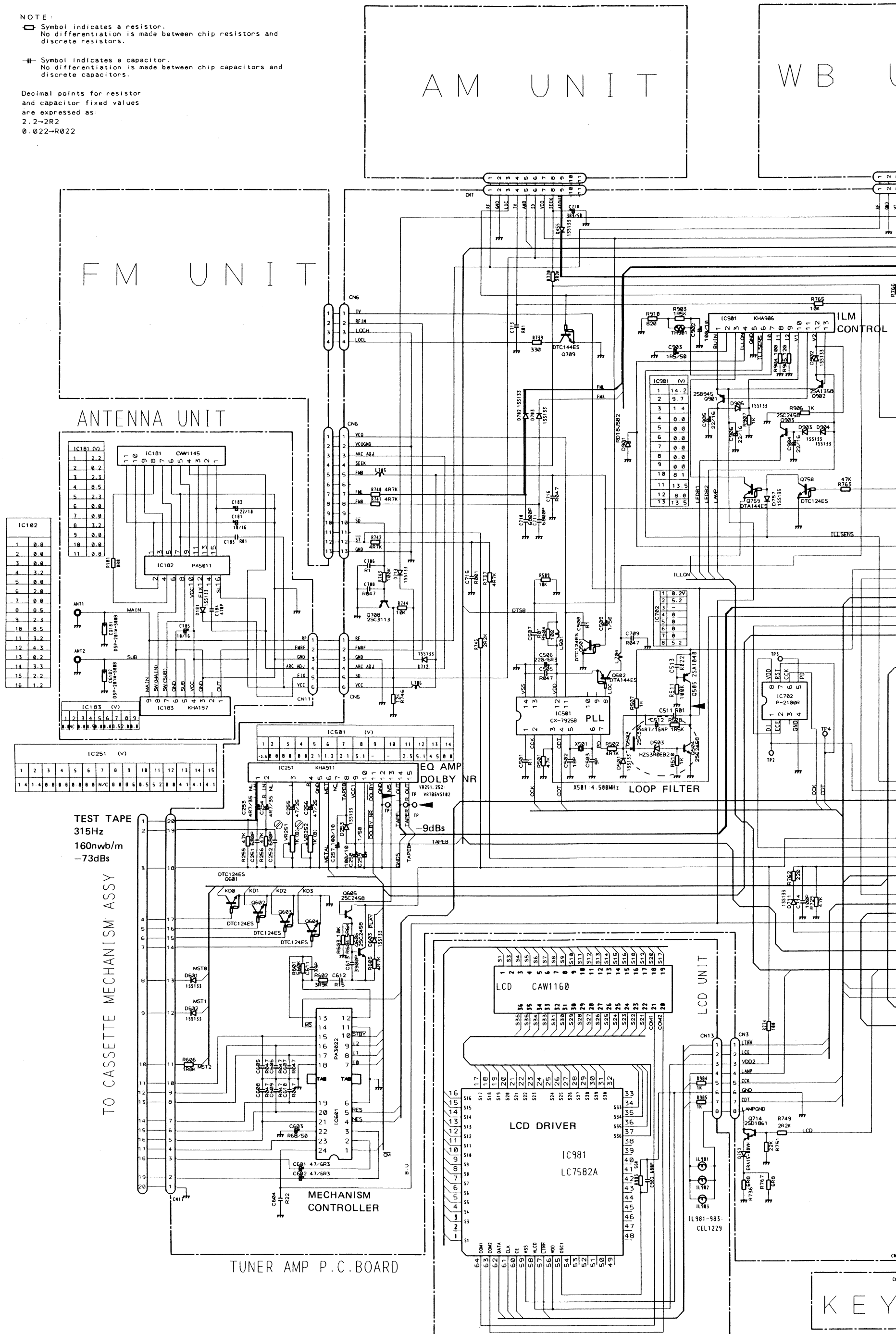
1	2	3	4	5	6	7	8
0.2V	5.2V	-	0V	0V	0V	0V	5.2V

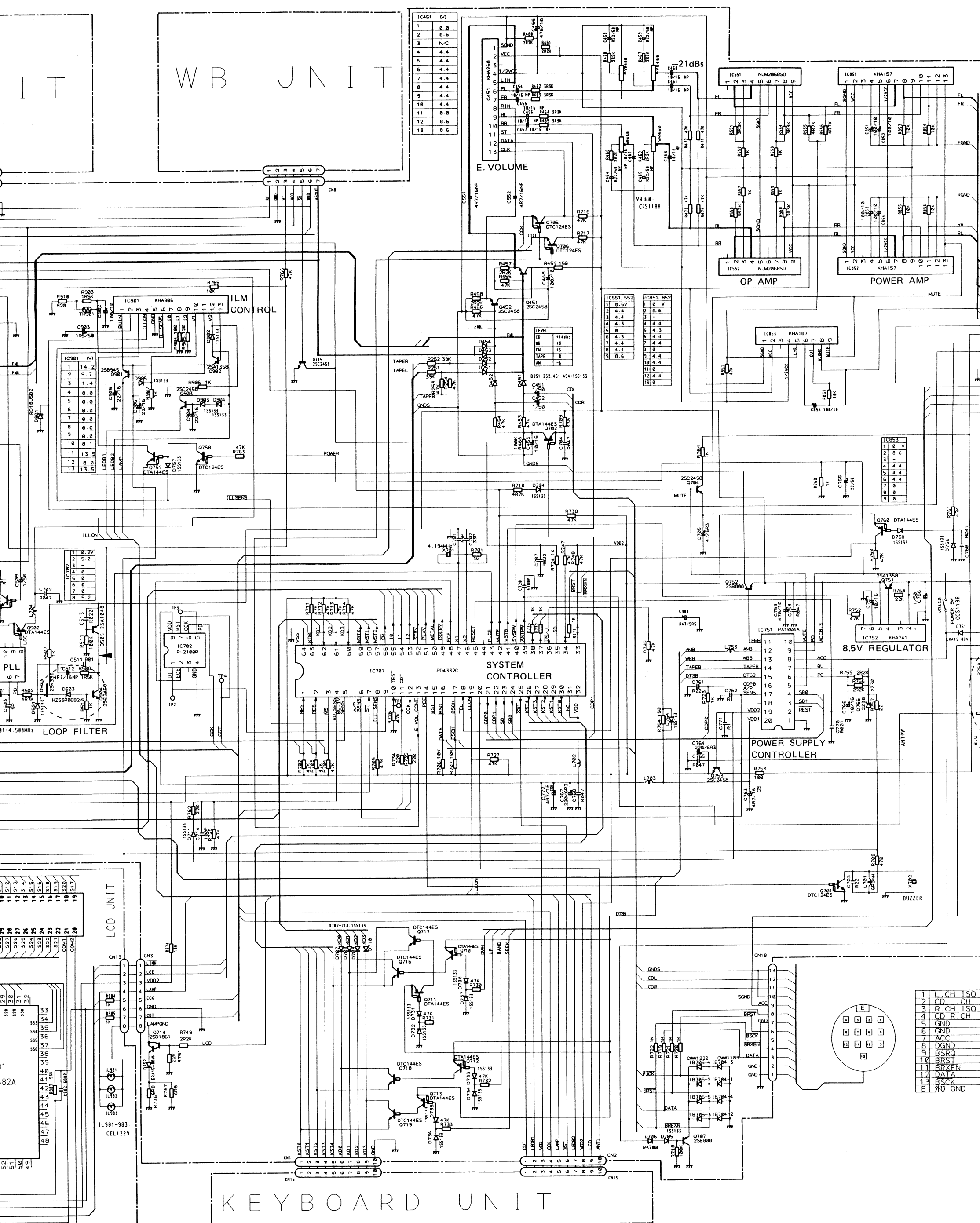
TO KEYBOARD UNIT CN16
TO KEYBOARD UNIT CN15

Fig. 10

11. SCHEMATIC CIRCUIT DIAGRAM

NOTE:
□ Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.
—||— Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.
Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022





IC451 (V)	
1	0.0
2	0.6
3	N/C
4	0.0
5	0.0
6	0.0
7	0.0
8	0.0
9	0.0
10	0.0
11	0.0
12	0.0
13	0.0

LEVEL	dB
FM	18
TAPE	15
AM	12

1	L CH ISO
2	R CH ISO
3	L CH ISO
4	R CH ISO
5	GND
6	GND
7	ACC
8	DATA
9	DATA
10	DATA
11	DATA
12	DATA
13	DATA
14	DATA
15	DATA
16	DATA
17	DATA
18	DATA
19	DATA
20	DATA
21	DATA
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26	DATA
27	DATA
28	DATA
29	DATA
30	DATA
31	DATA
32	DATA

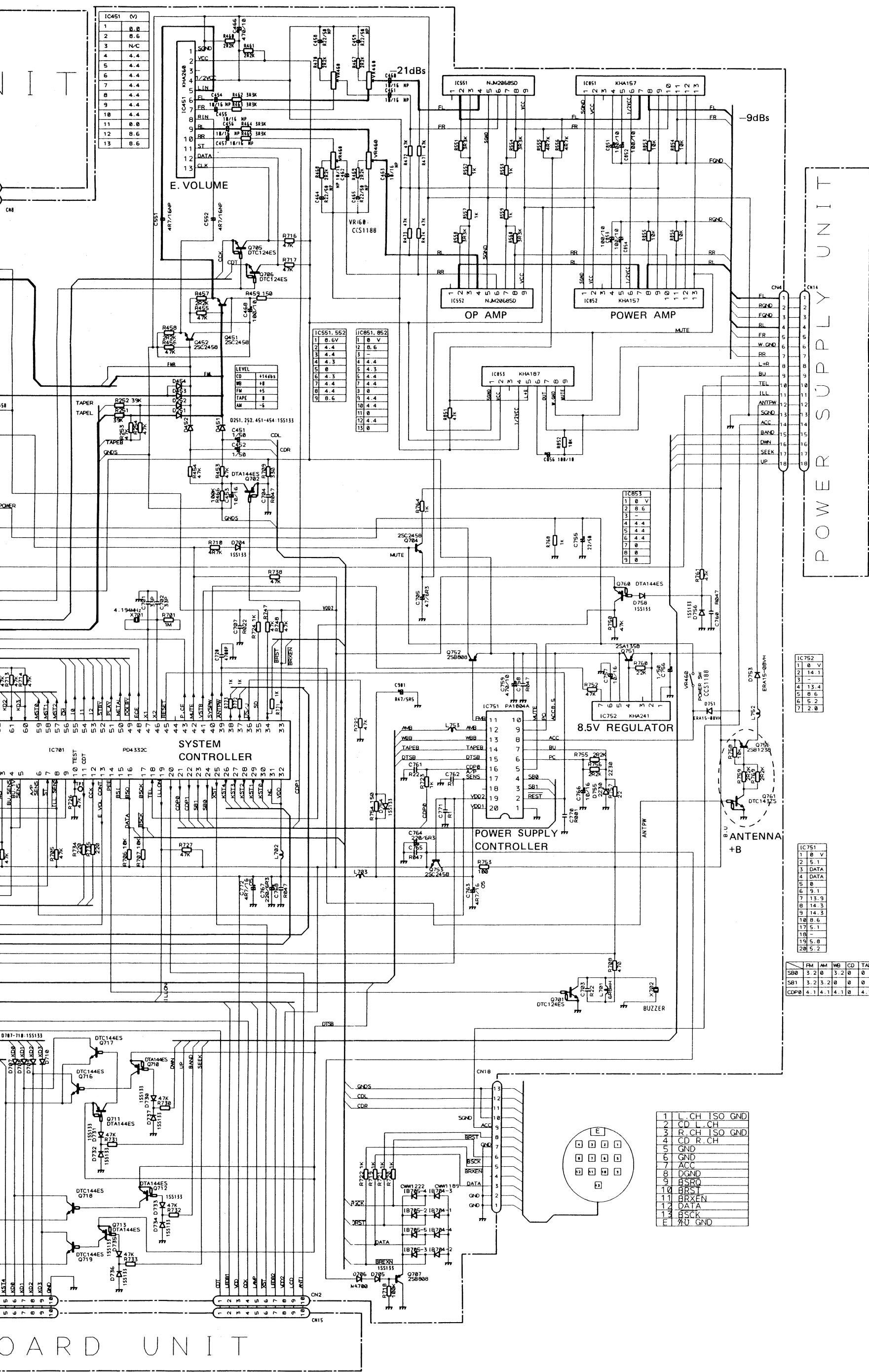


Fig. 11

12. CIRCUIT DIAGRAM AND P.C.BOARD PATTERN

● KEY BOARD UNIT, POWER SUPPLY UNIT AND WB UNIT

TO TUNER AMP P.C. BOARD

KEY BOARD UNIT

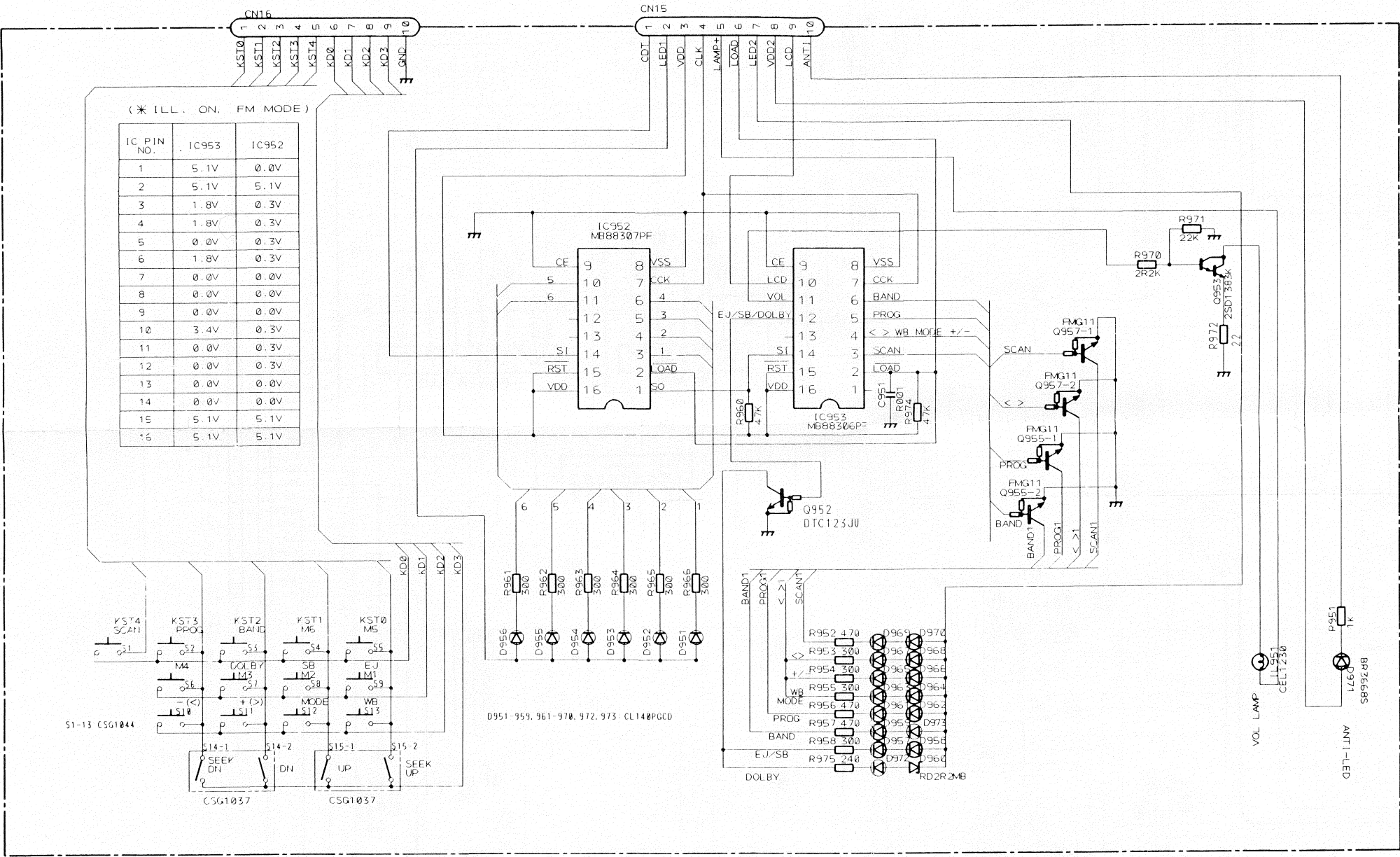
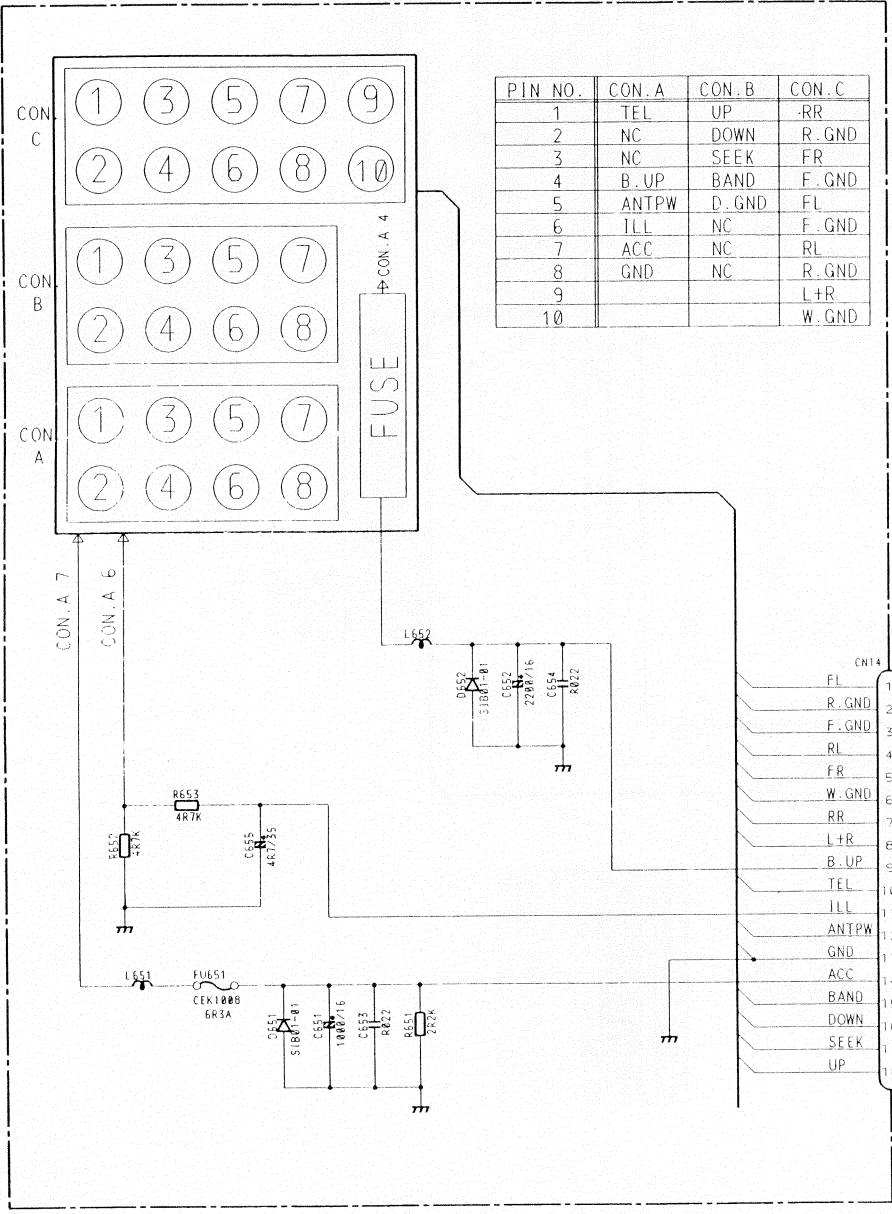


Fig. 12



POWER SUPPLY UNIT

Fig. 14

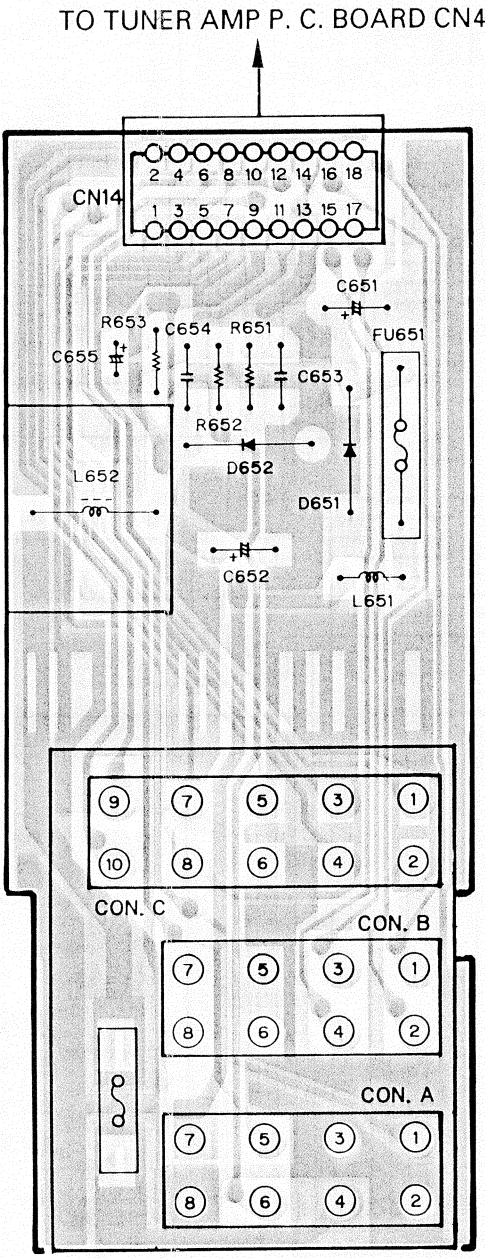
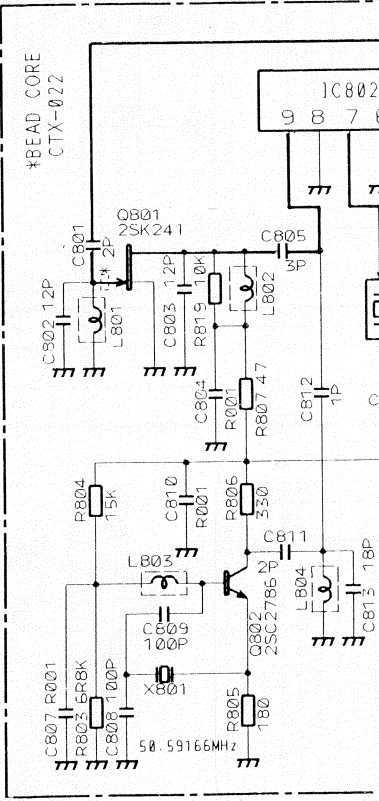


Fig. 15

WB UNIT



KEY BOARD UNIT

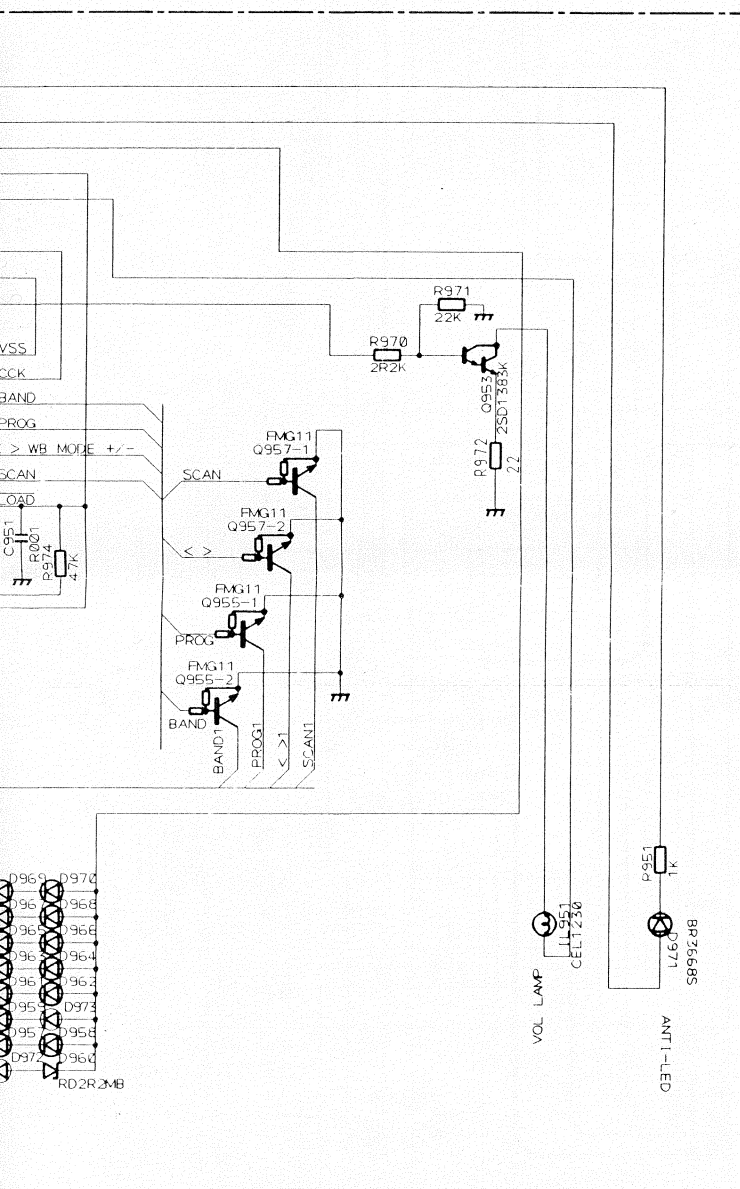


Fig. 12

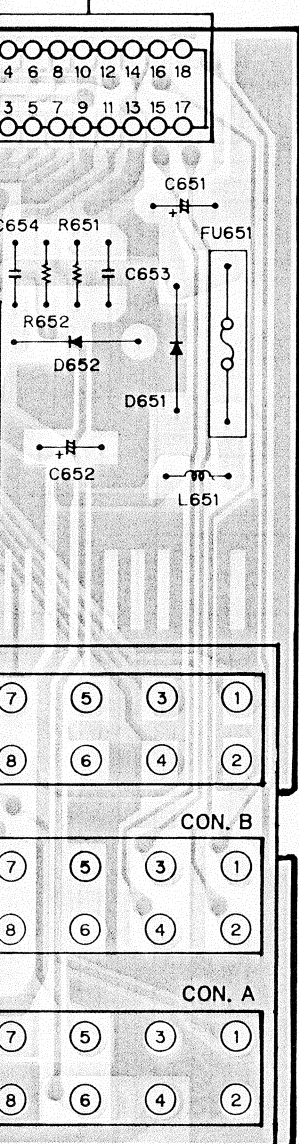
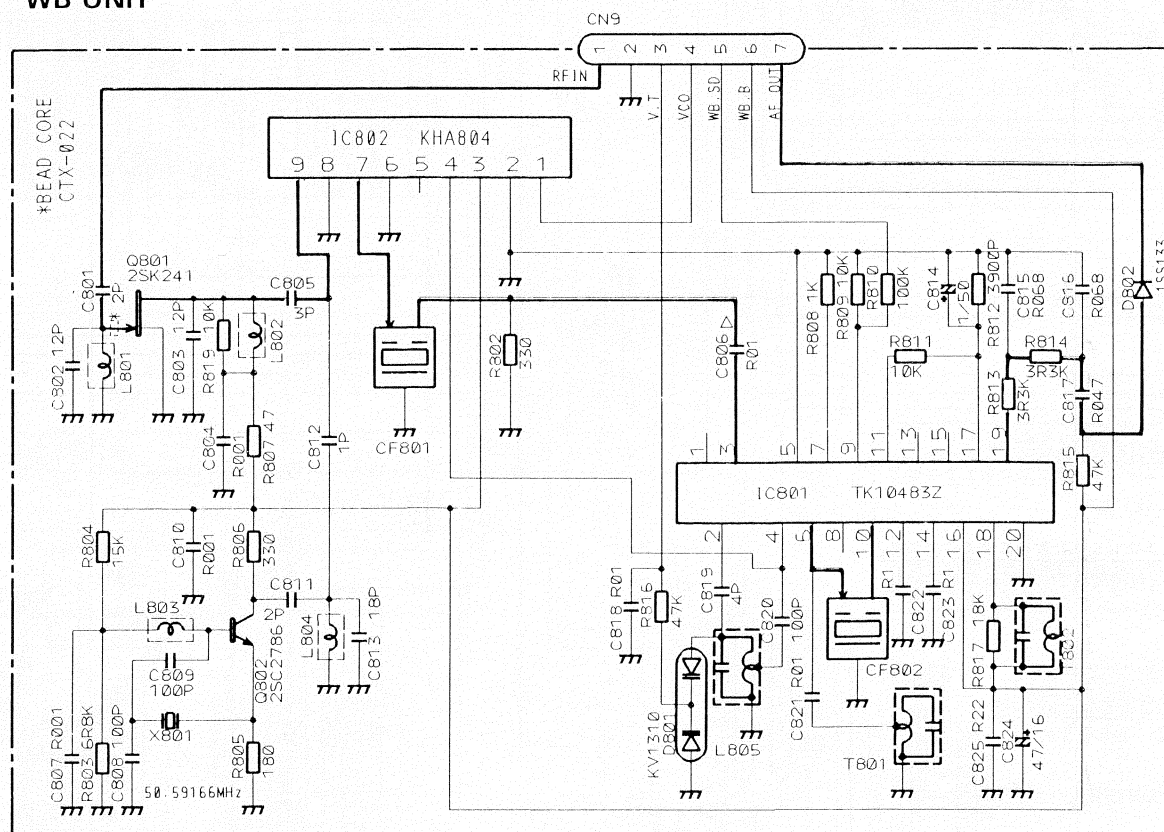
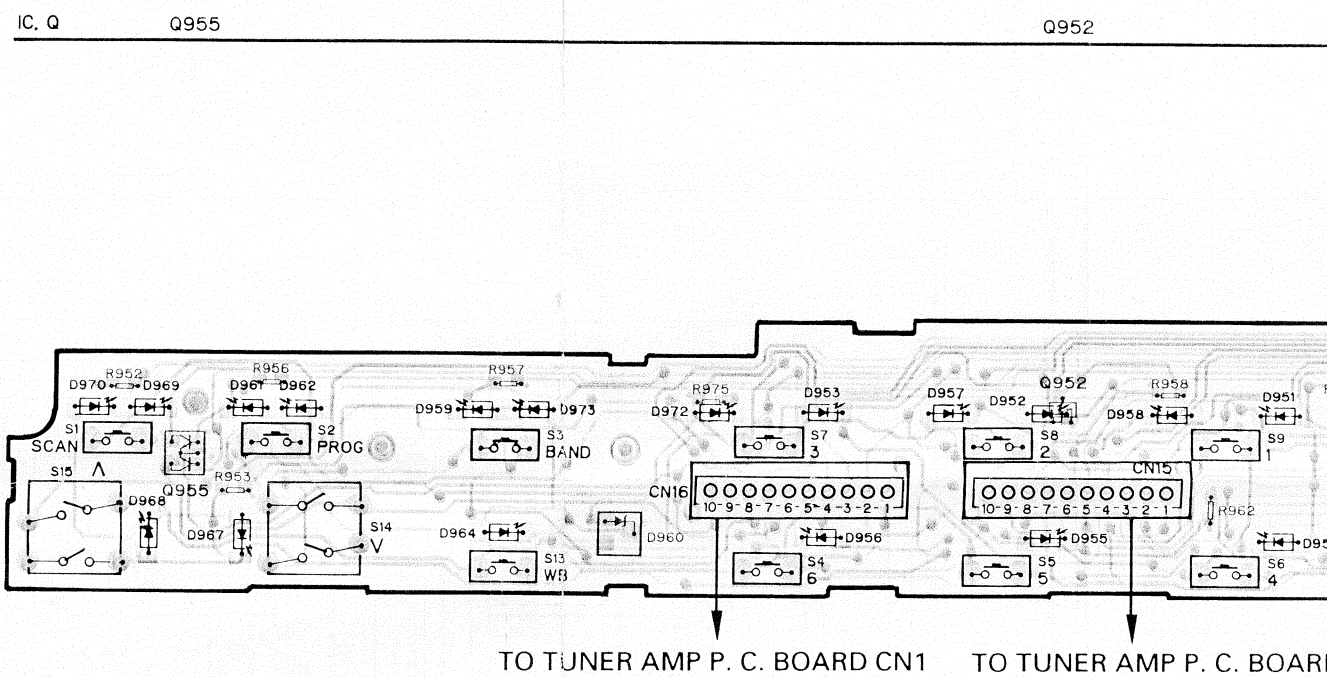


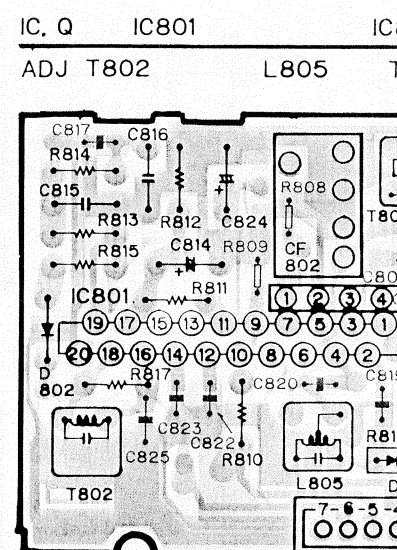
Fig. 15



IC802	
1	4.6V
2	0
3	8.5
4	7.8
5	-
6	0
7	8.2
8	0
9	1.7

IC801			
1	0	11	0.2
2	8.5V	12	7.6
3	1.8	13	8.5
4	7.8	14	7.6
5	0	15	0
6	8.4	16	8.5
7	0.6	17	0.2
8	0	18	8.5
9	8.3	19	3.9
10	7.6	20	0

Fig. 16



TO TUNER AMP

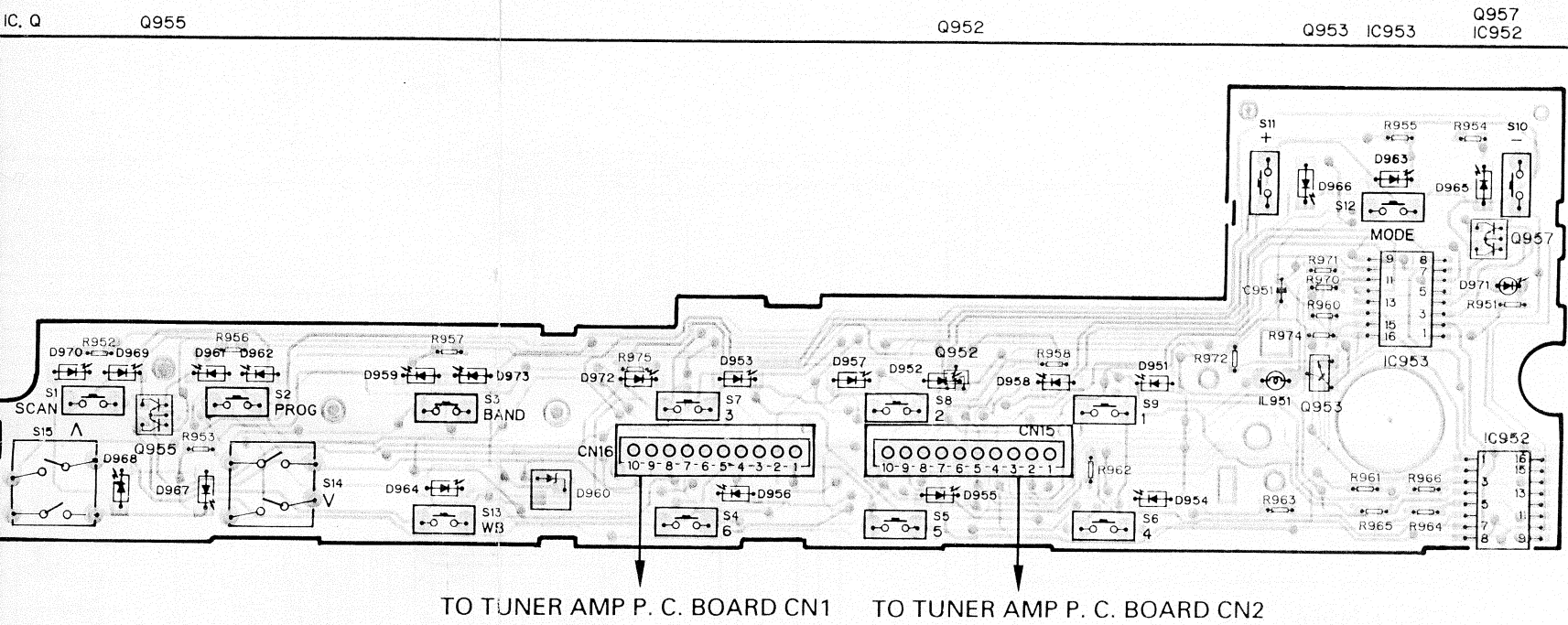


Fig. 13

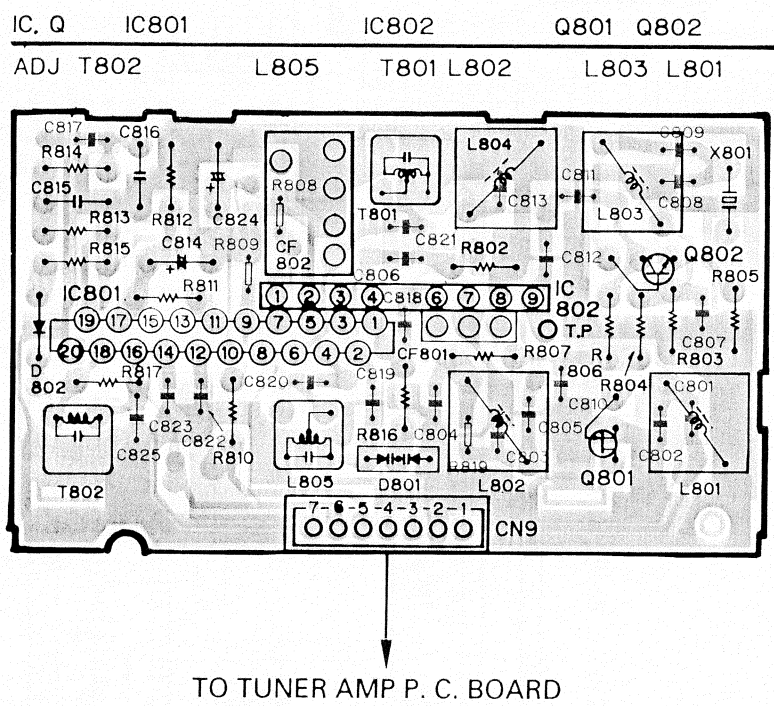
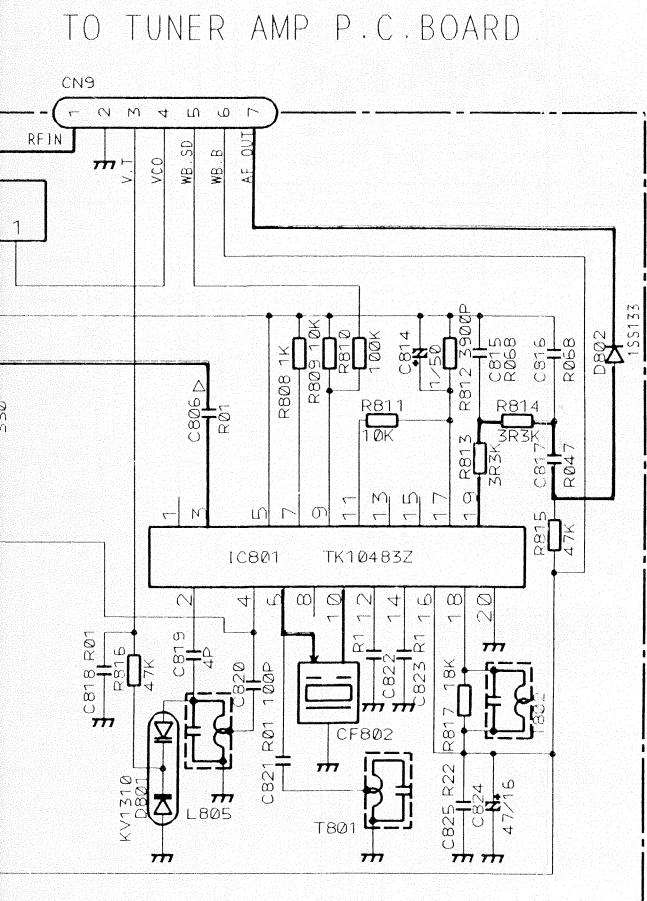


Fig. 17

6V	IC801		
1	0	11	0.2
2	8.5V	12	7.6
3	1.8	13	8.5
4	7.8	14	7.6
5	0	15	0
6	8.4	16	8.5
7	0.6	17	0.2
8	0	18	8.5
9	8.3	19	3.9
10	7.6	20	0

Fig. 16

• FM UNIT

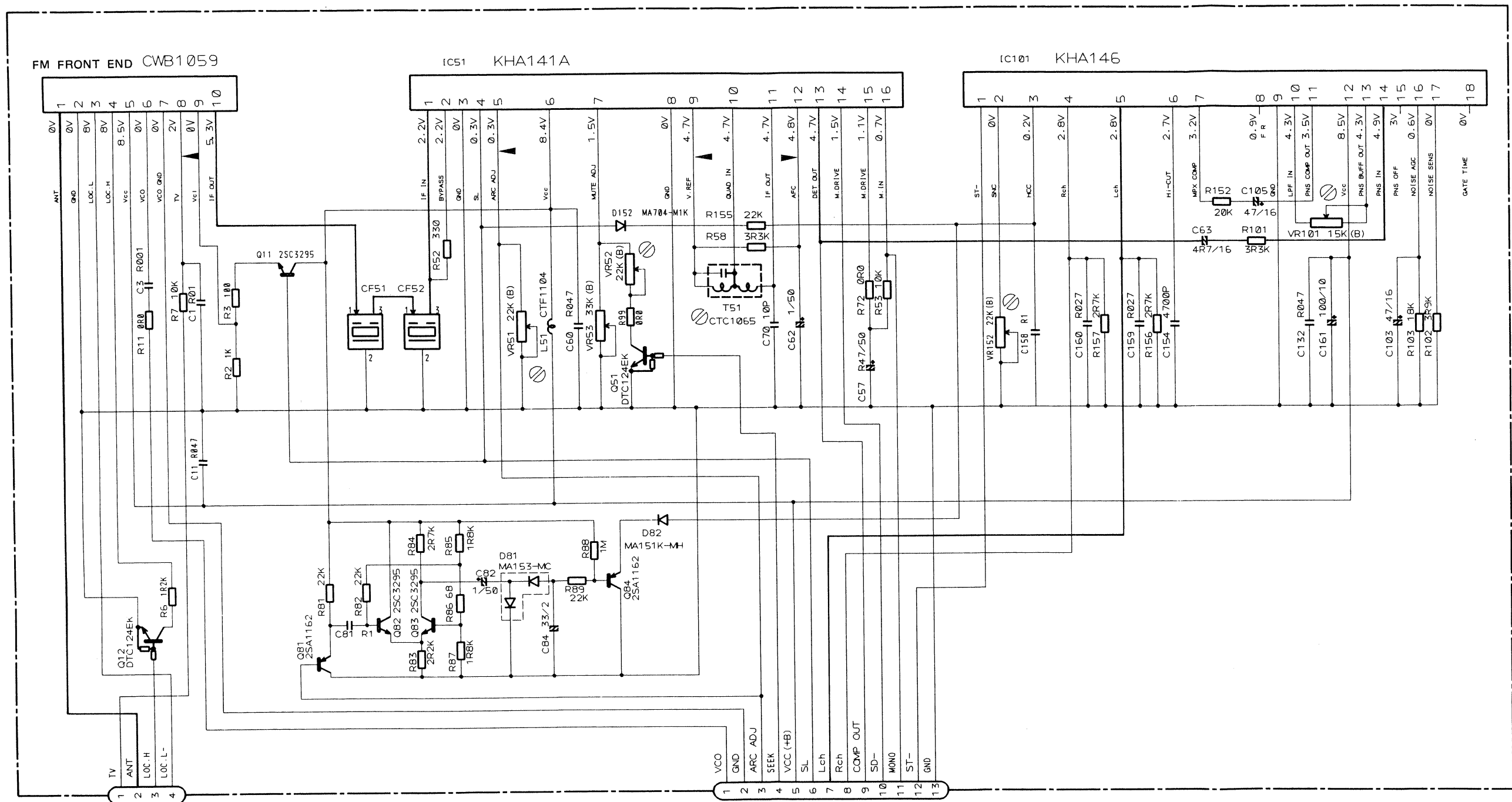


Fig. 18

IC, Q
ADJ

TO TUI

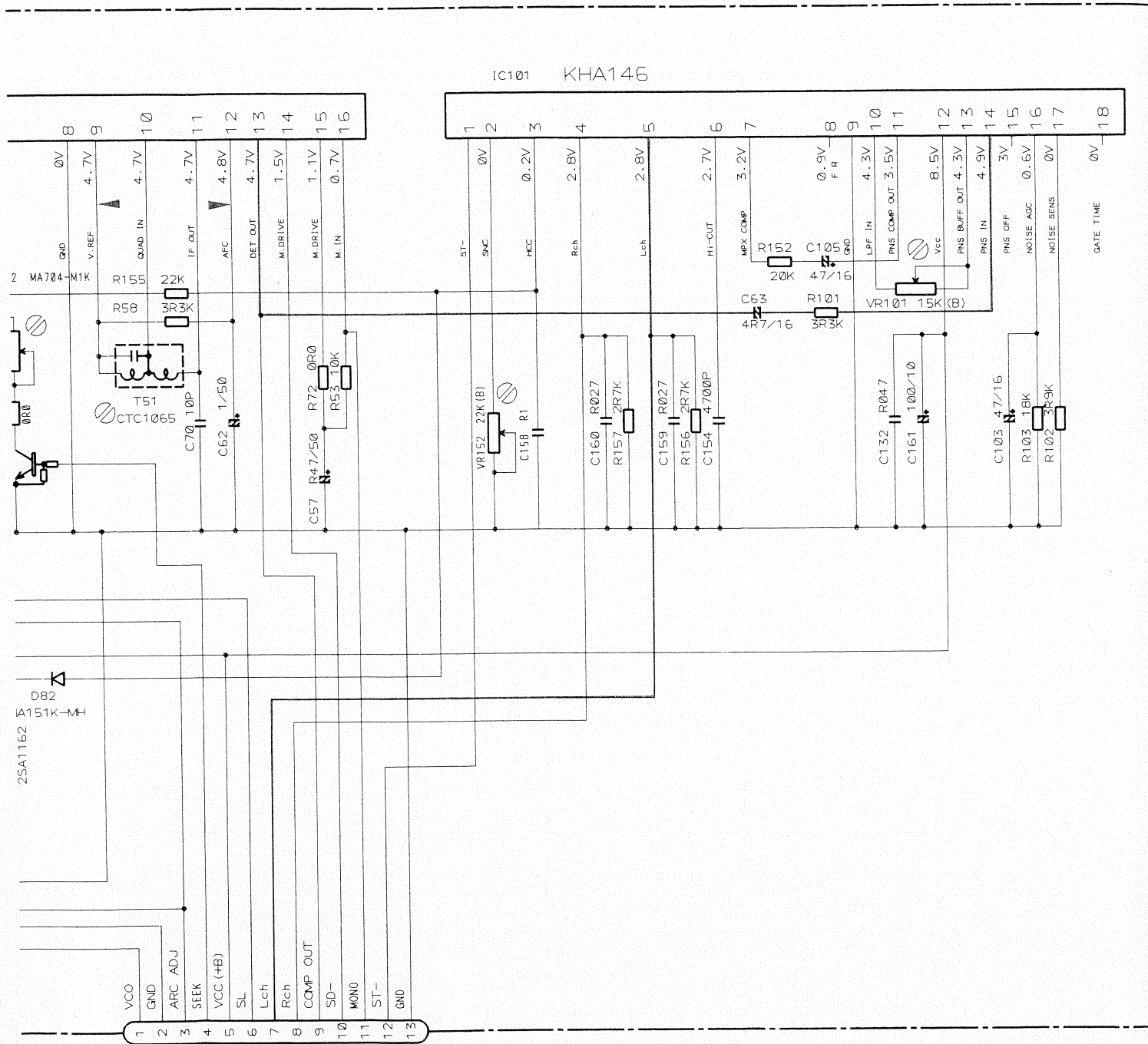


Fig. 18

IC 101

1	2	3	4	5	6	7	8	9
	0V	0.2V	2.8V	2.8V	2.7V	3.2V	0.9	0V
10	11	12	13	14	15	16	17	18
4.3V	3.5V	8.5V	4.3V	4.9V	3.0V	0.6V	0v	0V

IC 51

1	2	3	4	5	6	7	8
2.2V	2.2V	0V	0.3V	0.3V	8.4V	1.5V	0V
9	10	11	12	13	14	15	16
4.7V	4.7V	4.7V	4.8V	4.7V	1.5V	1.1V	0.7V

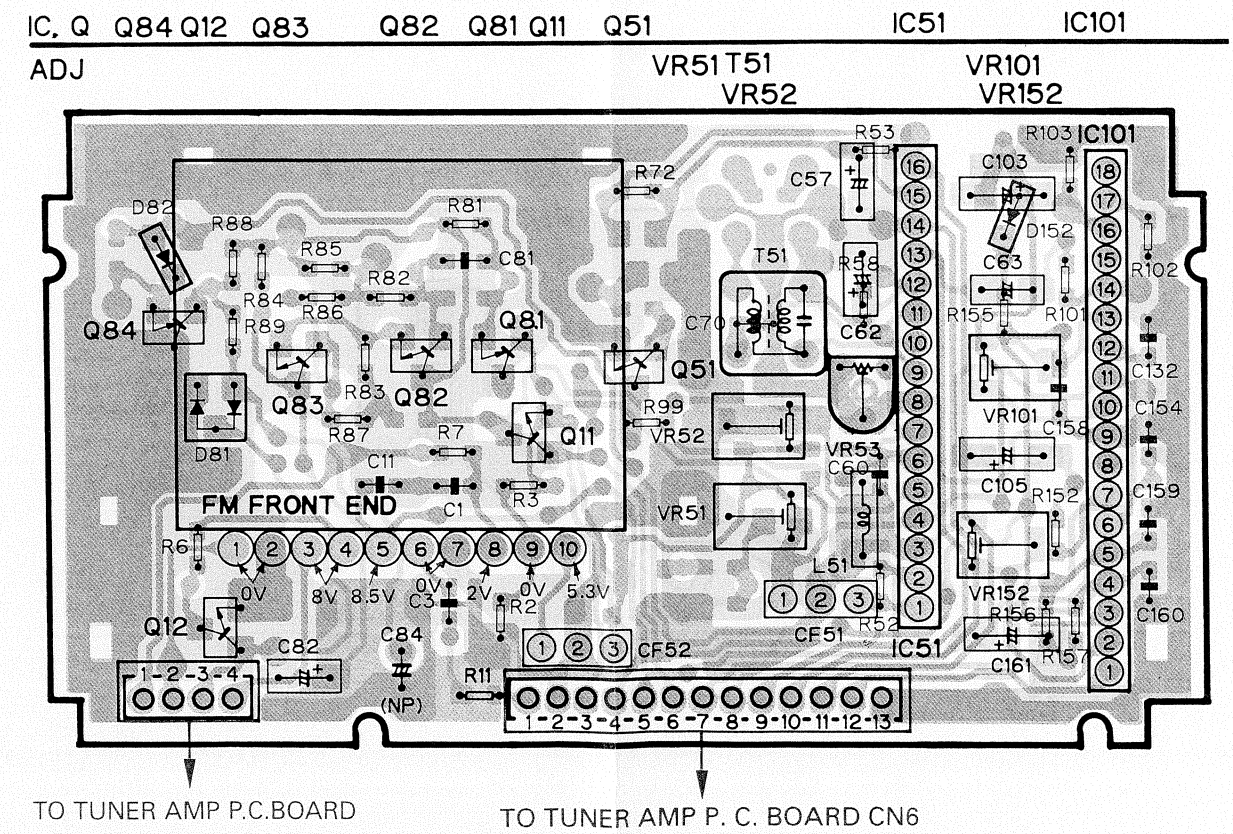


Fig. 19

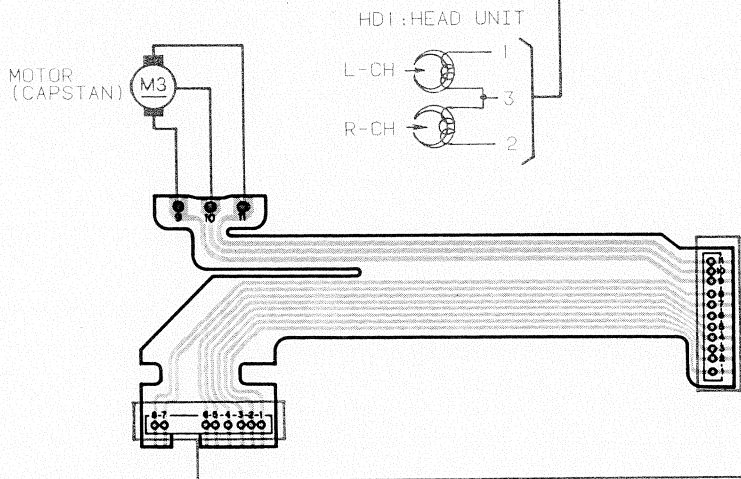
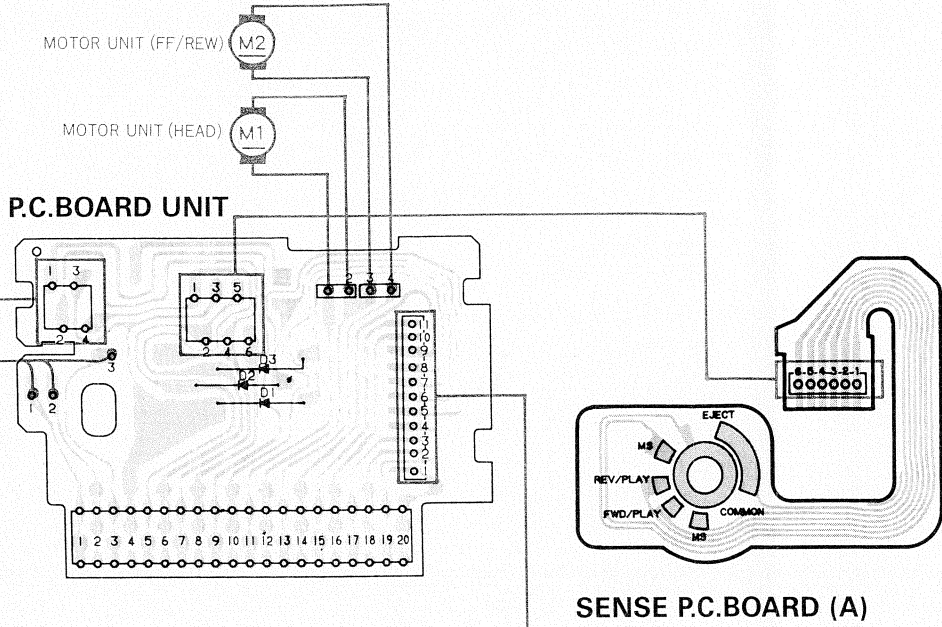
● CASSETTE MECHANISM ASSY

A

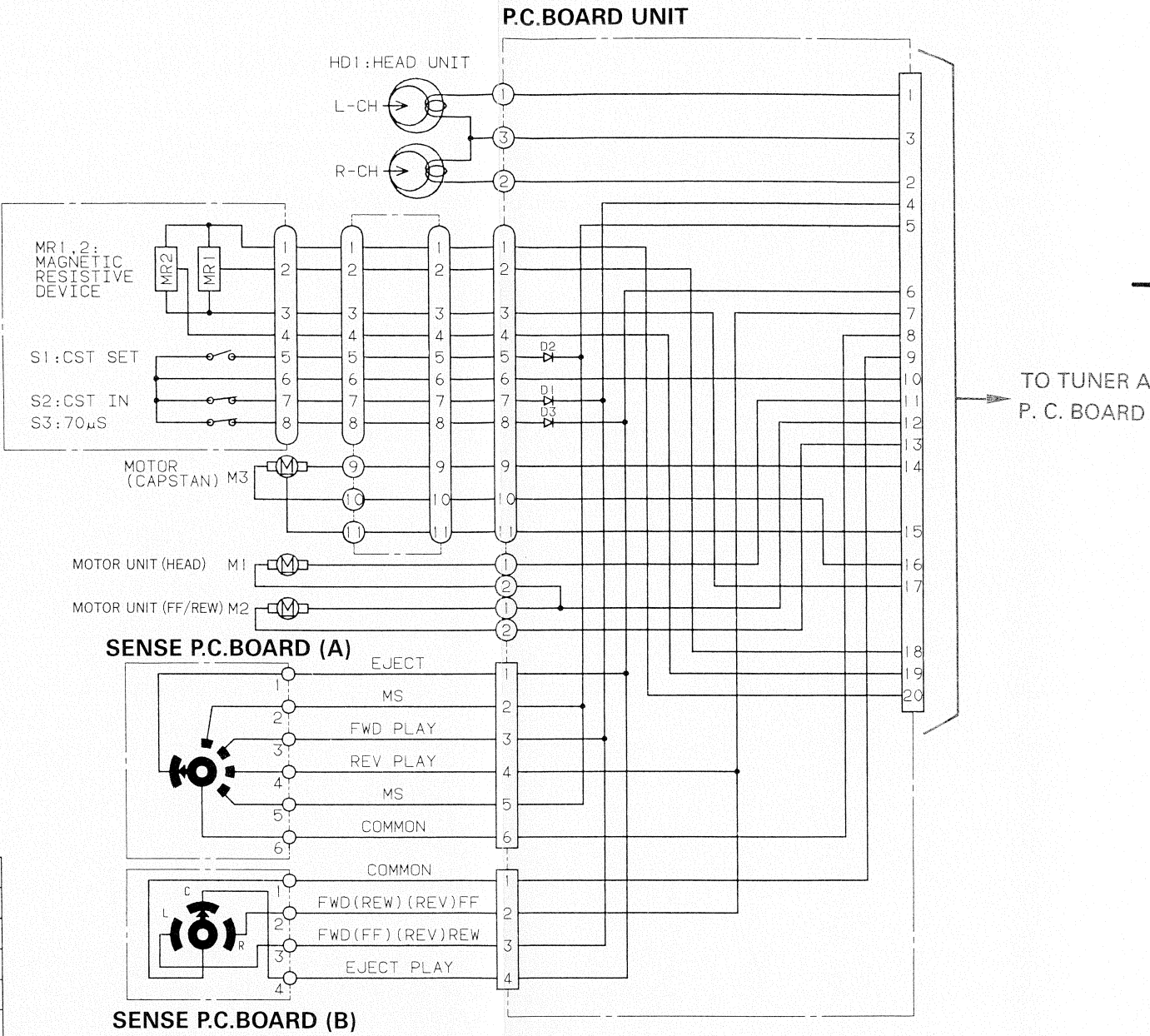
B

C

D



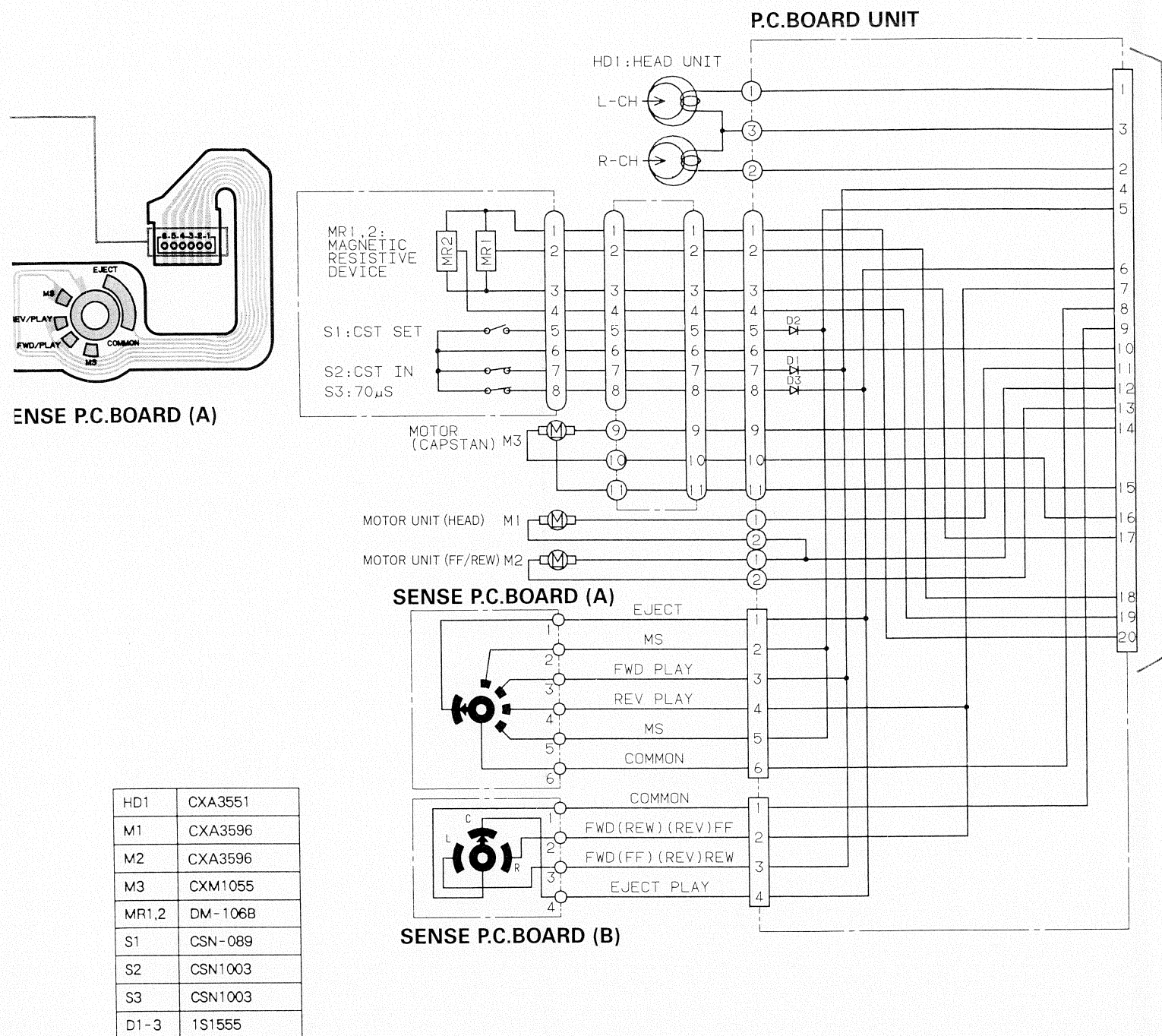
HD1	CXA3551
M1	CXA3596
M2	CXA3596
M3	CXM1055
MR1,2	DM-106B
S1	CSN-089
S2	CSN1003
S3	CSN1003
D1-3	1S1555



TO TUNER A
P. C. BOARD

IC 20
1
0.6V
13
8.4V

Fig. 20



• AM UNIT

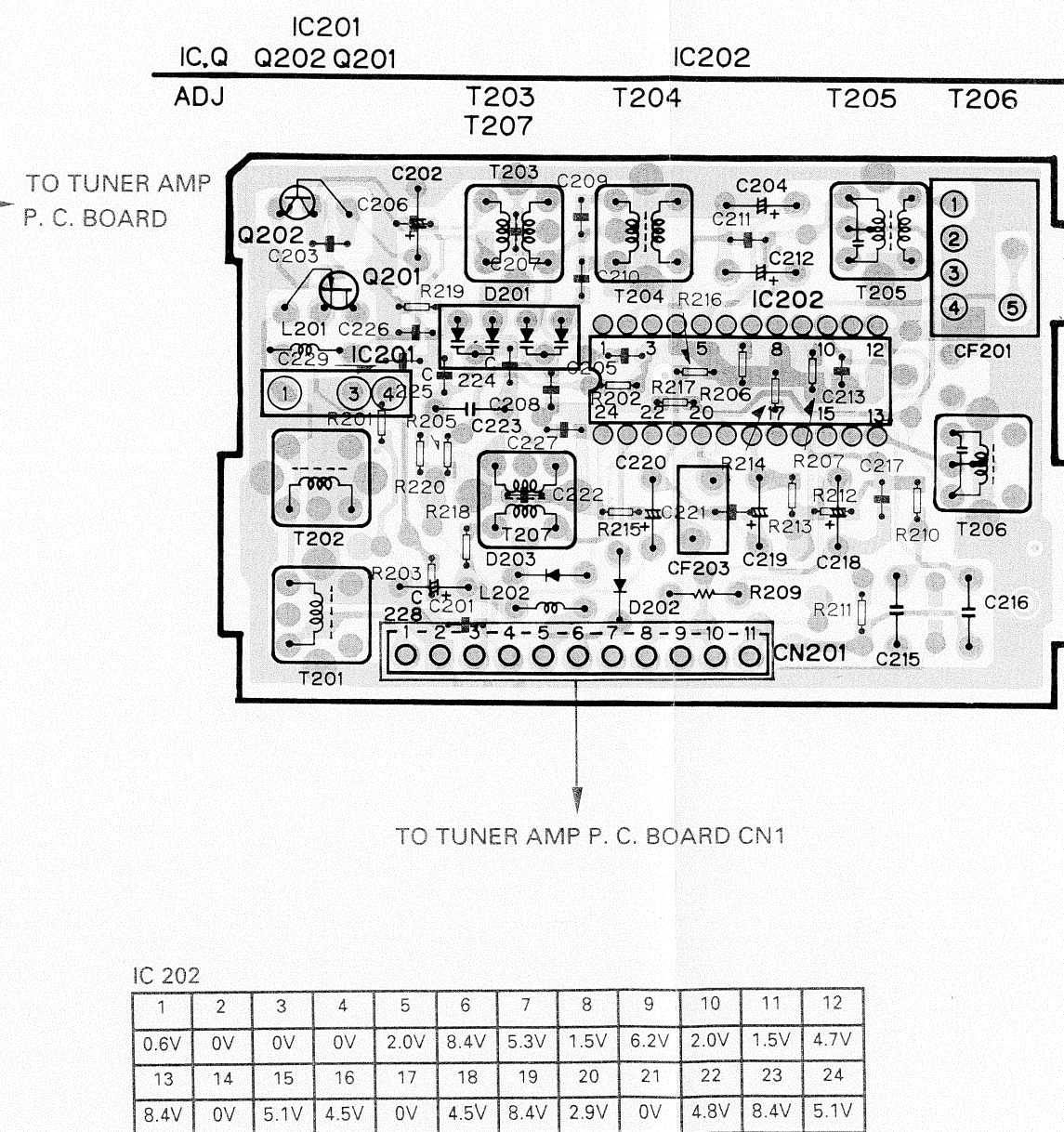


Fig. 20

Fig. 21

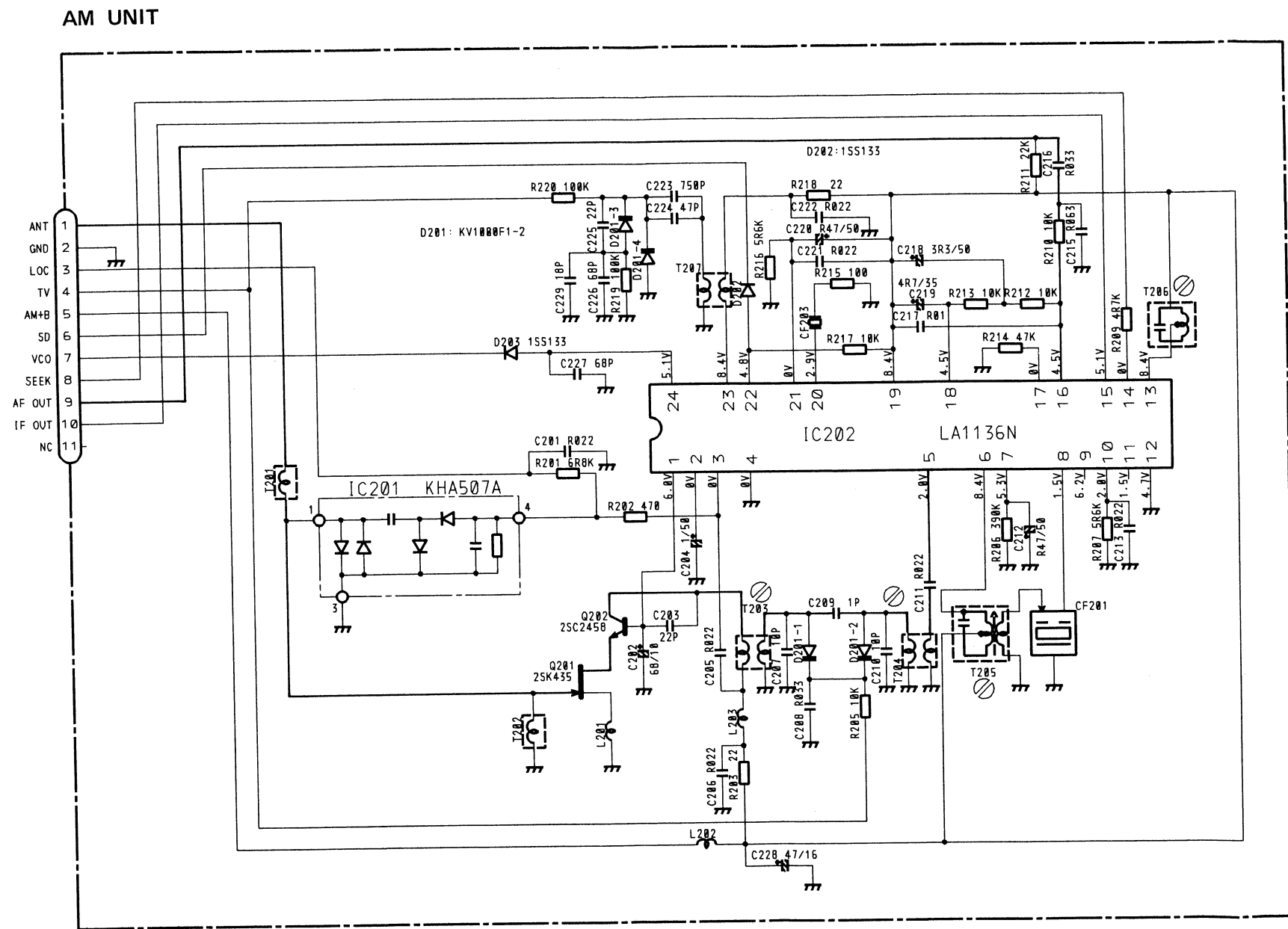


Fig. 22

13. CHASSIS EXPLODED VIEW

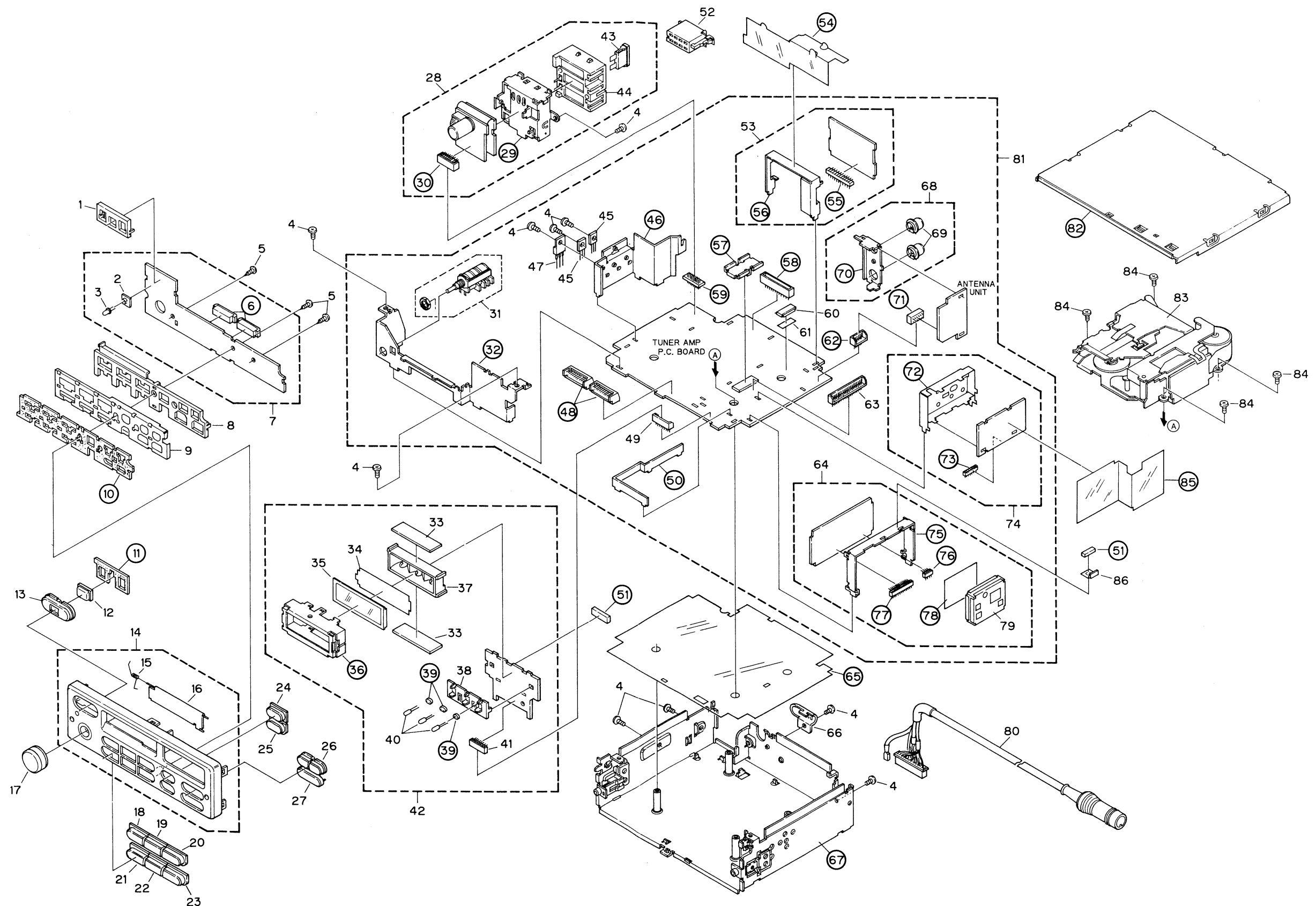


Fig. 23

NOTE:

- The parts marked with "●" may need long time to supply and their supply is subject to refuse as the case may be.
- Because the parts with encircled number shown on the dismantling drawing are not spare parts, we are unable to supply them in principle.

● Parts List

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Holder	CNV2765	46	Heat Sink	CNC3852
2	Spacer	CNV2060	47	Transistor (Q901)	2SB945
3	LED (D971)	BR3668S	48	Connector	CKS1654
4	Screw	BMZ30P060FMC	49	Plug	CKS-647
5	Screw	BPZ26P080FMC	50	Earth	CNC4022
6	Connector	CKS1660	51	Cushion	CNM3213
● 7	Key Board Unit	CWM2876	52	Connector	CKS2330
8	Holder	CNV2764	● 53	AM Unit	CWA1054
9	Earth	CNC3734	54	Insulator	CNM3119
10	Cushion	CNM3040	55	Plug	CKF1017
11	Cushion	CNM3041	56	Holder	CNC4020
12	Button (MODE)	CAC2919	57	Heat Sink	CNG-368
13	Button (+/-)	CAC2918	58	Plug	CKS-577
14	Grille Unit	CXA4304	59	Plug	CKS-731
15	Spring	CBH1425	60	IC (IC501)	CX-7925B
16	Door	CAT1398	61	Spacer	CNM3383
17	Knob	CAA1198	62	Plug	CKS-645
18	Button (1)	CAC2908	63	Plug	CKS-659
19	Button (2)	CAC2909	● 64	FM Unit	CWE1212
20	Button (3)	CAC2910	65	Insulator	CNM3116
21	Button (4)	CAC2911	66	Holder	CNC3736
22	Button (5)	CAC2912	67	Chassis Unit	CXA4279
23	Button (6)	CAC2913	68	Holder Unit	CXA4280
24	Button (BAND)	CAC2914	69	Antenna Jack	CKX1018
25	Button (WB)	CAC2916	70	Holder	CNC3735
26	Button (PROG/SCAN)	CAC2916	71	Connector	CKS-664
27	Button (UP, DOWN)	CAC2917	72	Case	CNC3854
● 28	Power Supply Unit	CWM2753	73	Plug	CKS1616
29	Holder	CNC3746	● 74	WB Unit	CWE1243
30	Connector	CKS-750	75	Holder	CNC3414
31	Volume (VR460)	CCS1188	76	Plug	CKS1614
32	Holder	CNC3737	77	Plug	CKS1621
33	Connector	CNV2920	78	Insulator	CNM2842
34	Sheet	CNM3143	79	FM Front End	CWB1059
35	LCD	CAW1160	80	Cord	CDE3712
36	Case	CNC3492	● 81	Tuner Amp Unit	CWM2874
37	Holder	CNV2946	82	Case	CNB1472
38	Holder	CNV2897	● 83	Cassette Mechanism Assy	CXX1678
39	Spacer	CNM-903	84	Screw	BMZ26P050FMC
40	Lamp (IL981-983)	CEL1229	85	Insulator	CNM3118
41	Connector	CKS-666	86	Earth	CNC4321
● 42	LCD Unit	CWM2875			
43	Fuse	CEK1135			
44	Connector	CKM1088			
45	Transistor (Q751, 902)	2SA1358			

14. PACKING METHOD

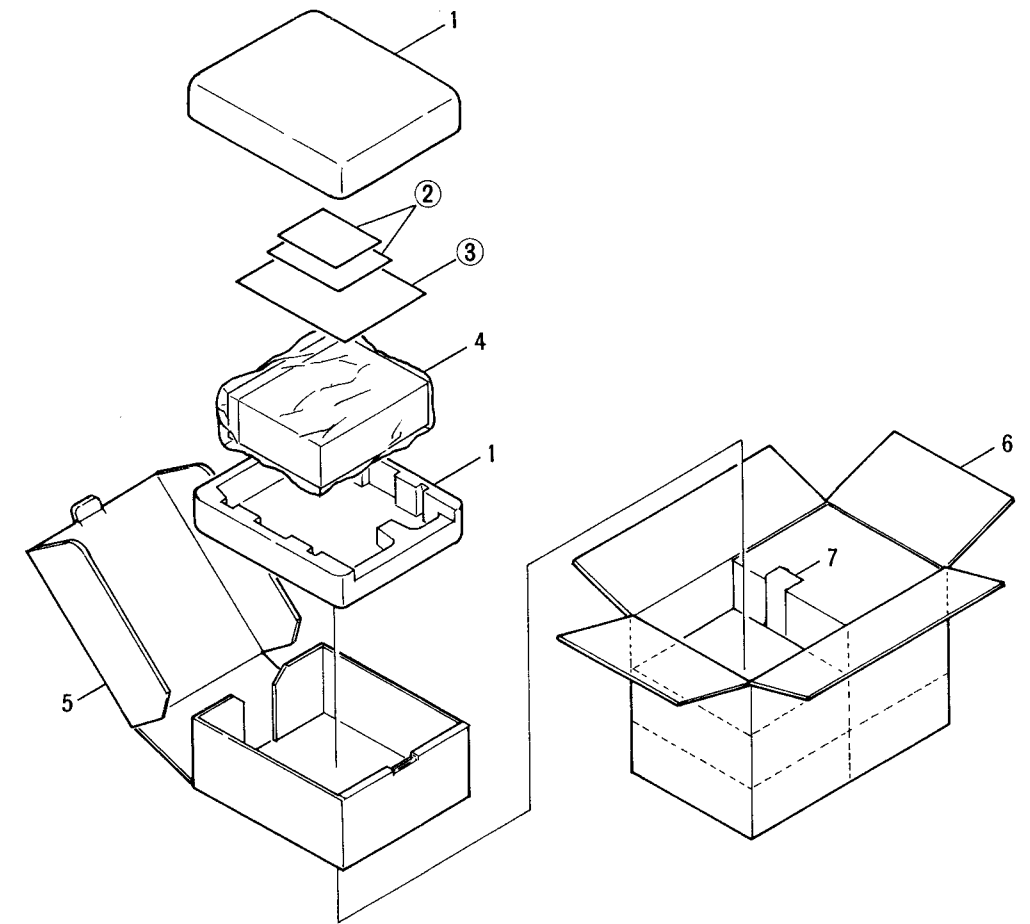


Fig. 24

● Parts List

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Styrofoam (×2) (US)	CHP1439	* 4-4	Card	CRY1024
	Styrofoam (×2) (X1H)	CHP1479	5	Carton (US)	CHG2093
* 2	Film	CNM1269		Carton (X1H)	CHG2200
* 3	Name Plate	CAL2380	6	Contain Box (US)	CHL2093
4-1	Polyethylene Bag	CEG-162	* 7	Contain Box (X1H)	CHL2200
4-2	WB Manual	CRB1105		Paper Sheet (X1H)	CHW1030
4-3	Owner's Manual (US) (English)	CRB1143			
	Owner's Manual (X1H) (English)	CRB1245			

*: Non Spare Part

15. CASSETTE MECHANISM EXPLODED VIEW

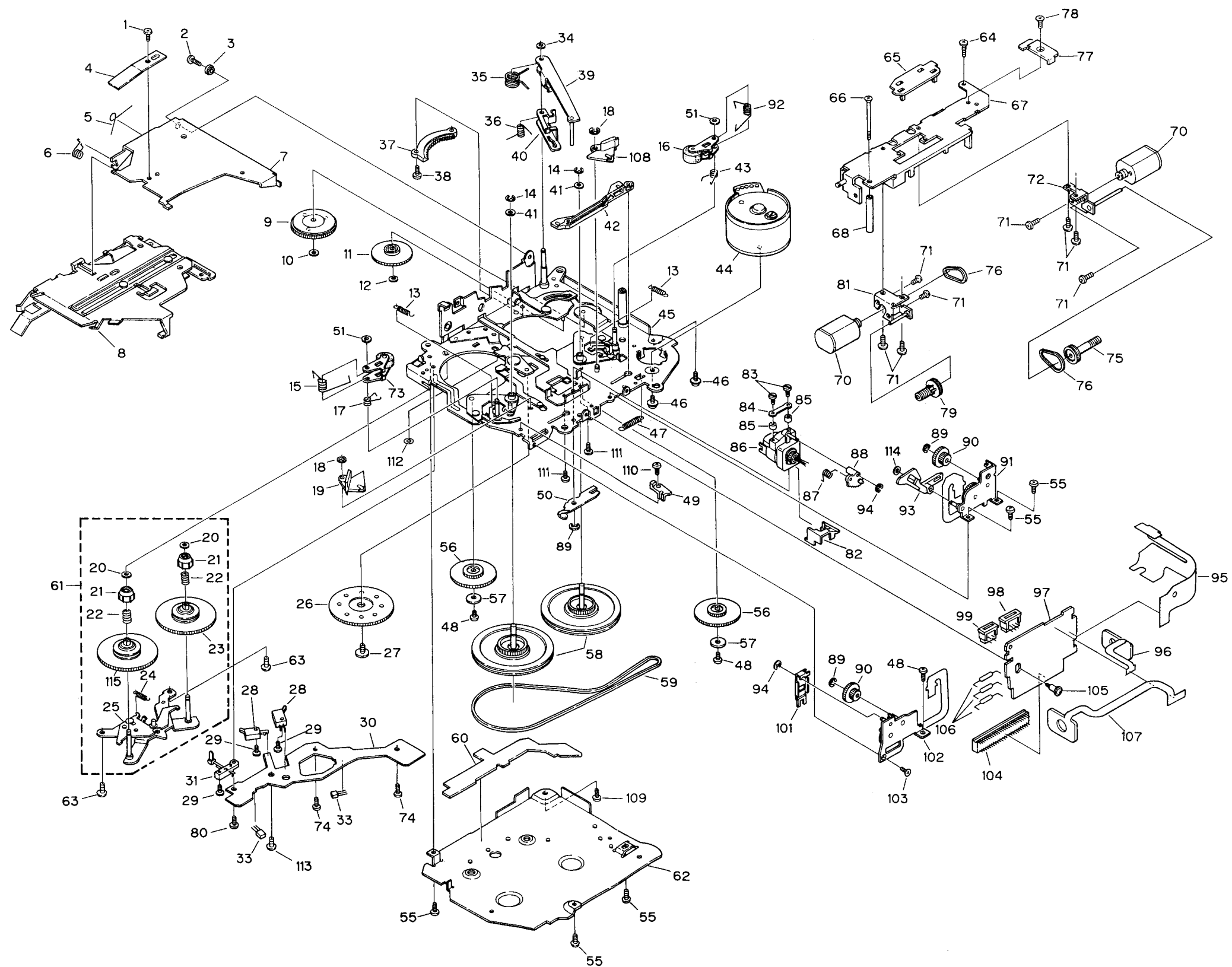


Fig. 25

● Parts List

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Screw(M1.4×1.4)	HBA-147	46	Screw	PMS26P025FMC
2	Screw	BMZ20P040FMC	47	Spring	CBH-830
3	Bush	CLB-663	48	Screw(M2×2.5)	HBA-175
4	Spring	CBE1023	49	Spacer	CNW-945
5	Spring	CBH-867	50	Spring	CBL1050
6	Spring	CBH-837	51	Washer	CBF1025
7	Arm	CNC2373	52	.....
8	Holder Unit	CXA4527	53	Spring	CBL-893
9	Gear Unit	CXA4022	54	Collar	CLA1110
10	Washer	CBF1026	55	Screw	BMZ20P025FMC
11	Gear	CNY-271	56	Gear	CNV1616
12	Washer	CBF-126	57	Collar	CLA1238
13	Spring	CBH-835	58	Flywheel	CNR1572
14	E Type Washer	CBG1003	59	Belt	CNT1046
15	Spring	CBH1277	60	Insulator	CNM2592
16	Pinch Roller Unit	CXA2608	61	Reel Assy	CXA4025
17	Spring	CBH1197	62	Cover	CNC2829
18	E Type Washer	YE25FUC	63	Screw	BMZ20P030FMC
19	Arm	CNV1254	64	Screw(M1.7×6)	CBA1125
20	Washer	CBF1022	65	Holder	CNV1252
21	Collar	CNW-932	66	Screw(M2×25)	CBA-165
22	Spring	CBH-827	67	Guide	CNC2219
23	Reel Unit	CXA4023	68	Spacer	CNC1651
24	Spring	CBH-868	69	.....
25	Bracket Unit	CXA1481	70	Motor	CXA3596
26	Gear	CNW-944		(FF/REW, Head Position)	
27	Screw(M2×4)	CBA1106	71	Screw(M2×2.2)	HBA-174
28	Switch(70μS, CST IN)	CSN1003	72	Bracket Unit	CXA2605
29	Screw(M1.7×5.5)	CBA1025	73	Pinch Roller Unit	CXA2609
30	P.C. Board	CNP1223	74	Screw(M2×2.5)	CBA1037
31	Switch(CST SET)	CSN-089	75	Pulley	CNV1255
32	.....		76	Belt	CNT1030
33	Magnetic Resistive	DM-106B	77	Plate	CNC3632
34	Washer	CBF-046	78	Screw(M2×2.2)	HBA-212
35	Spring	CBH1270	79	Pulley	CNV1256
36	Spring	CBH-886	80	Screw(M2×5)	CBA1054
37	Gear	CNV1075	81	Bracket Unit	CXA1381
38	.....		82	Cover	CNV1489
39	Arm Unit	CXD2859	83	Screw(M1.4×8)	CBA1169
40	Arm	CNG-618	84	Spring	CBE-114
41	Washer	HBF-179	85	Azimuth Rubber	CNY-134
42	Lever	CNV1257	86	Head Unit	CXA3551
43	Spring	CBH1196	87	Spring	CBH-829
44	Motor(Capstan)	CXM1055	88	Gear	CNW-939
45	Chassis Unit	CXA3544	89	E Type Washer	YE12FUC
			90	Gear	CNV1262

Mark No.	Description	Part No.	Mark No.	Description	Part No.
91	Holder Assy	CXA1546	106	Diode	1S1555
92	Spring	CBH1276	107	P.C. Board	CNP2110
93	Arm	CNV1495	108	Arm	CNV1253
94	E Type Washer	YE15FUC	109	Screw(M2×6)	CBA1004
95	P.C. Board	CNP1227	110	Screw(M2×4)	CBA1015
96	P.C. Board	CNP1738	111	Screw(M2×2.5)	CBA1041
97	P.C. Board	CNP2747	112	Washer	CBE-112
98	Connector(6P)	CKS1075	113	Screw(M1.7×3)	CBA-186
99	Connector(4P)	CKS1073	114	Washer	CBF1022
100	.....		115	Reel Unit	CXA4024
101	Arm	CNH-004			
102	Holder Assy	CXA1548			
103	Screw(M2×2)	HBA-209			
104	Connector(20P)	CKS-678			
105	Screw(M2×2×3)	CBA1022			

16. ELECTRICAL PARTS LIST

- NOTE:
- Parts whose parts numbers are omitted are subject to being not supplied.
 - The part numbers shown below indicate chip components.

Chip Resistor
RS1/8S□□□J, RS1/10S□□□J
Chip Capacitor (except for OQS.....)
CKS....., CCS....., CSZS.....

Unit Number:
Unit Name :AM Unit

MISCELLANEOUS

====Circuit Symbol & No. Part	Name=====	Part No.
IC 201		KHA507A
IC 202		LA1136N
Q 201		2SK435
Q 202		2SC2458
D 201		KV1280F1-2
D 202 203		1SS133
L 201	Inductor	CTF-185
L 202	Ferri-Inductor	LAU680K
L 203	Ferri-Inductor	LAU330K
T 201	Coil	CTB1051
T 202	Coil	CTB-171
T 203	Coil	CTB1044
T 204	Coil	CTB1045
T 205	Coil	CTE1030
T 206	Coil	CTE1034
T 207	Coil	CTB1043
CF 201	Filter	CTF-100
CF 203	Ceramic Resonator	CTF1039
RESISTORS		
R 201		RS1/10S682J
R 202		RS1/10S471J
R 203 218		RS1/10S220J
R 205 210 212 213 217		RS1/10S103J
R 206		RS1/10S394J
R 207		RS1/10S562J
R 209		RD1/4PS472JL
R 211		RS1/10S223J
R 214		RS1/10S473J
R 215		RS1/10S101J
R 216		RS1/10S562J
R 219 220		RS1/10S104J
CAPACITORS		
C 201 205 206 211 213 221 222		CKSQYB223K25
C 202		CEA680M10LS
C 203 225		CCSQCH220J50
C 204		CEA010M50LS2
C 207 210		CCSQCH100D50
C 208		CKSQYB333K25
C 209		CCSQCH010C50
C 212 220		CEA47M50LS2
C 215		CQMA683J50
C 216		CQMA333J50
C 217		CKSQYB103K50
C 218		CEA3R3M50LS
C 219		CEA4R7M35LS
C 223		CQPAH751G2A
C 224		CCSQCH470J50

====Circuit Symbol & No. Part	Name=====	Part No.
C 226		CCSQCH680J50
C 227		CCSQCH680J50
C 228		CEA470M16LS
C 229		CCSQCH180J50
Unit Number: Unit Name :FM Unit		
MISCELLANEOUS		
IC 51		KHA141A
IC 101		KHA146
Q 11 82 83		2SC3295
Q 12 51		DTC124EK
Q 81 84		2SA1162
D 81		MA153-MC
D 82		MA151K-MH
D 152		MA704-M1K
L 51	Inductor	CTF1104
T 51	Coil	CTC1065
CF 51 52	Ceramic Filter	CTF-182
VR 51	Semi-fixed 22kΩ (B)	CCP1021
VR 52	Semi-fixed 22kΩ (B)	CCP1021
VR 53	Semi-fixed 33kΩ (B)	VRTB4VS333
VR 101	Semi-fixed 15kΩ (B)	CCP1020
VR 152	Semi-fixed 22kΩ (B) FM Front End	CCP1021 CWB1059
RESISTORS		
R 2		RS1/10S102J
R 3		RS1/10S101J
R 6		RS1/10S122J
R 7		RS1/10S103J
R 11		RS1/10S0R0J
R 52		RS1/10S331J
R 53		RS1/10S103J
R 58 101		RS1/10S332J
R 72		RS1/10S0R0J
R 81 82 89 155		RS1/10S223J
R 83		RS1/10S222J
R 84 156 157		RS1/10S272J
R 85 87		RS1/10S182J
R 86		RS1/10S680J
R 88		RS1/10S105J
R 99		RS1/10S0R0J
R 102		RS1/10S392J
R 103		RS1/10S183J
R 152		RS1/10S203J
CAPACITORS		
C 1		CKSQYB103K50
C 3		CKSQYB102K50
C 11 60 132		CKSQYB473K25
C 57		CEVR47M50
C 62 82		CEV010M50

====Circuit Symbol & No. Part	Name=====	Part No.
C 63		CEVNP4R7M16
C 70		CCSQCH100D50
C 81 158		CKSQYB104K25
C 84	33 μF/2V	CCH1055
C 103 105		CEV470M16
C 154		CKSQYB472K50
C 159 160		CKSQYB273K50
C 161		CEV101M10
Unit Number: Unit Name : WB Unit		
MISCELLANEOUS		
IC 801		TK10483Z
IC 802		KHA804
Q 801		2SK241
Q 802		2SC2786
D 801		KV1310
D 802		1SS133
L 801 802 804	Coil	CTC1006
L 803	Coil	CTC1030
L 805	Coil	CTE1001
T 801	Coil	CTE1002
T 802	Coil	CTE1003
CF 801	FM Ceramic Filter	CTF-101
CF 802	Filter	CTF1004
X 801	Crystal Resonator Bead Core	CSS1001 CTX-022
RESISTORS		
R 802 806		RD1/4PS331JL
R 803		RD1/4PS682JL
R 804		RD1/4PS153JL
R 805		RD1/4PS181JL
R 807		RD1/4PS470JL
R 808		RS1/10S102J
R 809 819		RS1/10S103J
R 810		RD1/4PS104JL
R 811		RD1/4PS103JL
R 812		RD1/4PS392JL
R 813 814		RD1/4PS332JL
R 815 816		RD1/4PS473JL
R 817		RD1/4PS183JL
CAPACITORS		
C 801 811		CCSQCH020C50
C 802 803		CCSQCH120J50
C 804 807 810		CKSQYB102K50
C 805		CCSQCH030C50
C 806 818 821		CKSQYB103K50
C 808 809		CCSQYJ101J50
C 812		CCSQCH010C50
C 813		CCSQCH180J50
C 814		CEA010M50LS2
C 815 816		CQEA683J50
C 817		CKSQYB473K25
C 819		CCSQCH040C50
C 820		CCSQCH101J50
C 822 823		CKSQYF104Z25
C 824		CEA470M16LS
C 825		CKSYF224Z50
Unit Number : Unit Name : Power Supply Unit		
MISCELLANEOUS		
D 651 652		SIB01-01
L 651	Coil	CTH1077
L 652	Coil	CTH1092
FU 651	Fuse 6.3A Fuse 7.5A	CEK1008 CEK1135

====Circuit Symbol & No. Part	Name=====	Part No.
RESISTORS		
R 651		RD1/4PS222JL
R 652 653		RD1/4PS472JL
CAPACITORS		
C 651	1000 μF/16V	CCH1057
C 652	2200 μF/16V	CCH1001
C 653 654		CKDYF223Z50
C 655		CEA4R7M35L2
Unit Number: Unit Name :Tuner Amp Unit		
Tuner Amp Unit Consists of Tuner Amp P.C.Board Antenna Unit		
MISCELLANEOUS		
IC 181		CWW1145
IC 182		PA5011
IC 183		KHA197
IC 251		KHA911
IC 451		KHA260
IC 501		CX-7925B
IC 551 552		NJM2068SD
IC 601		PA3022
IC 701		PD4332C
IC 702		P-2100R
IC 751		PA1004A
IC 752		KHA241
IC 851 852		KHA157
IC 853		KHA187
IC 901		KHA906
Q 451 452 504 605 606 704 715 753 903		2SC2458
Q 501 601 602 603 604 701 705 706 758		DTC124ES
Q 502 702 710 711 712 713 759 760		DTA144ES
Q 503		2SK330
Q 505		2SA1048
Q 707 752		2SB808
Q 708		2SC3113
Q 709		DTC144ES
Q 714		2SD1861
Q 716 717 718 719		DTC144ES
Q 751 902		2SA1358
Q 756		2SB1238
Q 761		DTC143ZS
Q 901		2SB945
D 181 251 252 253 451 452 453 454 455 501		1SS133
D 503		HZS3R0EB2
D 601 602 603 702 703 704 705 707 708 709		1SS133
D 706		MA700
D 710 711 712 713 730 731 732 733 734 735		1SS133
D 736 737 754 756 757 758 902 903 904		1SS133
D 751 753		ERA15-08VH
D 752		ERA15-08VH
D 755		2Z30
D 901		RD18JSB2
D 905		1SS133
L 501 704 753	Ferri-Inductor	LAU150K
L 701	Inductor	CTF1051
L 702	Inductor	LPSQR68K
L 703 705 706	Inductor	LPSQ220K
L 752	Inductor	CTF1053
CG181 182	Surge Protector Thermistor	DSP-201M ERP-F3A2M681Z
TH 901		CWW1189
IB 704		CWW1222
IB 705		CSS1011
X 501	Crystal Resonator	

RESISTORS

[illegible][illegible]

R 736	767	RS1/10S6R8.
R 745	756	RS1/10S222.
R 746		RS1/10S123.
R 751	760	RS1/10S223.
R 757		RS1/10S220.

R 759 769	RS1/8S222J
R 768	RD1/4PS102JL
R 770	RS1/10S222J
R 771 772 773	RS1/10S102J
R 774	RS1/10S101J

R 852	853	854	855	856	RS1/10S103J
R 905					RS1/10S121J
R 910					RS1/10S821J

CAPACITORS

C 181	185	453	757	766	CEA100M16LS2
C 182					CEAS220M10
C 183	507	511	713		CKSQYF103Z50
C 184					CCSQL471J50
C 251	252				CCSQCH681J50

C 253	254									CEANL4R7M35LL
C 255	256									CEA470M25L2
C 257	258	468	851	852	853	854	856	902		CEA101M10LS
C 259	451	452	509	756						CEA010M50LS2
C 454	455	456	457	460	461	462	463			CEALNP100M16

C 458	459	464	465	CEALNPR22M50
C 466	759			CEA471M10L2
C 501	508	706	762	CKSQYF104Z50
C 502				CCSQCH18QJ50
C 503				CCSQCH090D50

[illegible]

C 613	CKSQYB392K50
C 701 702	CCSQCH330J50
C 710 711	CKSQYB682K50
C 714	CCSQCH101J50
C 715 770	CKSQYB102K50

C 716	CKSQYF473Z50
C 718	CEA3R3M50LS
C 720	CKSQYB472K50
C 755	CEA220M50L2
C 758 760 765 768	CKSQYF473Z50

C 763	772		CASA4R7M16
C 771			CKSQYF104Z50
C 791			CKSQYF473Z50
C 901	0.47 μ F/5.5V		CCL1016
C 903			CEA1R5M50LS2

C 904 905 906 CEA220M16LS

Unit Name : LCD Unit

MISCELLANEOUS

IC 981				LC7582A
IL 981	982	983	Lamp	CEL1229
			LCD	CAW1160

RESISTORS

R 983	RS1/10S563J
R 984 985	RS1/10S102J

CAPACITORS

C 982	CCSQCH681J50
C 983	CKSYF224Z50

Unit Number:
Unit Name : Key Board Unit

MISCELLANEOUS

IC 952	MB88307PF
IC 953	MB88306PF
Q 952	DTC123JU
Q 953	2SD1383K
Q 955 957	FMG11

[illegible]

S	1	2	3	4	5	6	7	8	9	10	CSG1044
S	11	12	13	Switch						CSG1044	
SW	14	15	Switch						CSG1037		
IL	951	Lamp						CEL1230			

RESISTORS

[illegible]

====Circuit Symbol & No. Part	Name=====	Part No.
-------------------------------	-----------	----------

CAPACITORS

C 951		CKSQYB102K50
-------	--	--------------

Unit Number:

Unit Name :Switch P.C.Board

S 1	Switch(CST SET)	CSN-089
S 2 3	Switch(CST IN,70 μ S)	CSN1003
MR 1 2	Magnetic Resistive Device	DM-106B

Unit Number:

Unit Name :P.C.Board Unit

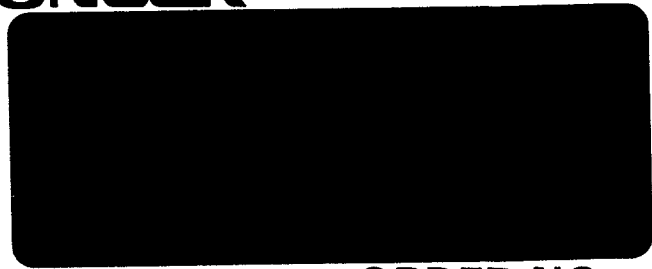
D 1 2 3		1S1555
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Miscellaneous Parts List

HD 1	HeadUnit	CXA3551
M 1 2	Motor(Head,FF/REW)	CXA3596
M 3	Motor(Capstan)	CXM1055

107
xp

Service Manual



ORDER NO.
CRT-468-0

CASSETTE MECHANISM ASSEMBLY

CX-156/A, CX-156/B

- This service manual is for cassette mechanism assembly used in car stereo components.
- Refer to the service manual for individual models for details on sections other than the cassette mechanism assembly.

Model	Service Manual	Cassette Mechanism Assembly
FX-K5/EW	CRT-469	CX-156/A
FX-K5B/EW		CX-156/A
FX-K5SDK/WG		CX-156/A
FEX-55/US, CA, CS	CRT-471	CX-156/A
FEX-50/ES	CRT-470	CX-156/A
KX-E60/EW	CRT-476	CX-156/B

Model	Service Manual	Cassette Mechanism Assembly

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1. REPLACEMENT OF PARTS IN CASSETTE MECHANISM

• Belt and capstan motor (M3) replacement

1. Remove the four screws and the cover. (Fig. 1)
2. The belt in Fig. 2 can be replaced. (Be sure that the belt is not greased and not twisted.)
3. To replace the capstan motor, remove the two screws shown in Fig. 2.

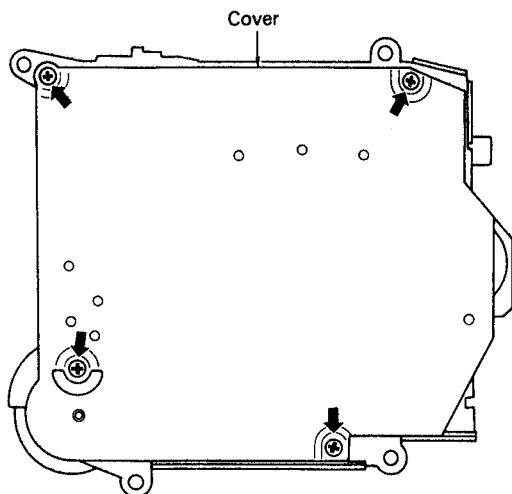


Fig. 1

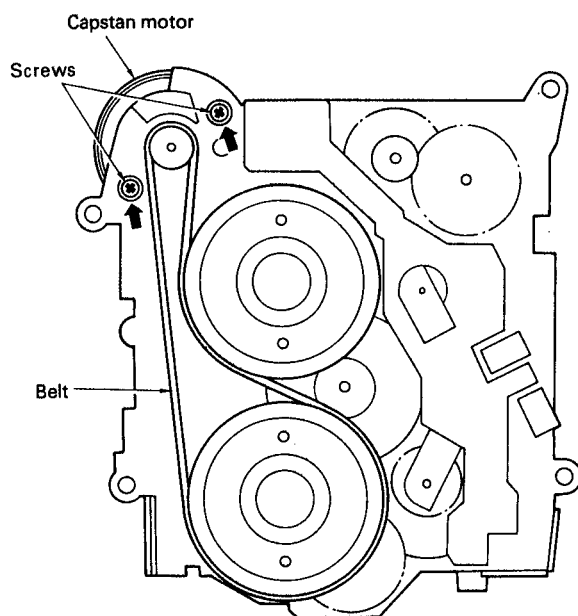


Fig. 2

• Cassette holder removal

1. Turn the capstan motor until the cassette holder drops down. (Do not turn the flywheel directly by hand.)
2. Remove the screw labeled "B", the collar and the spring.
3. Remove unit "A" and the cassette holder "D" and "E".

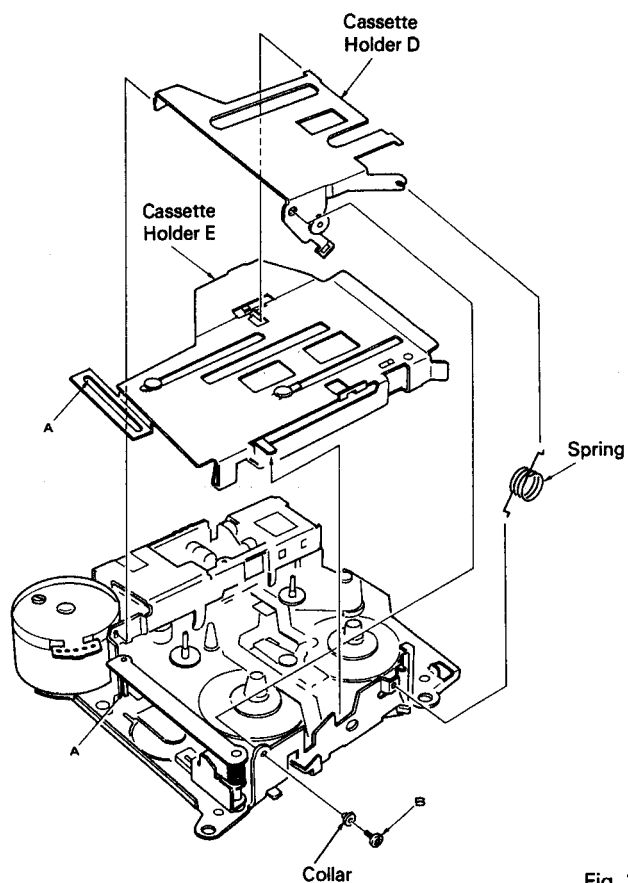


Fig. 3

• Head unit replacement

1. Remove the washer and spring.
2. Remove the screw labeled "F", and the head unit can be removed in the opposite direction.
3. Be careful of the following point during reassembly.
 - Put the head unit pins through the lever holes. (One in front and one in back.)

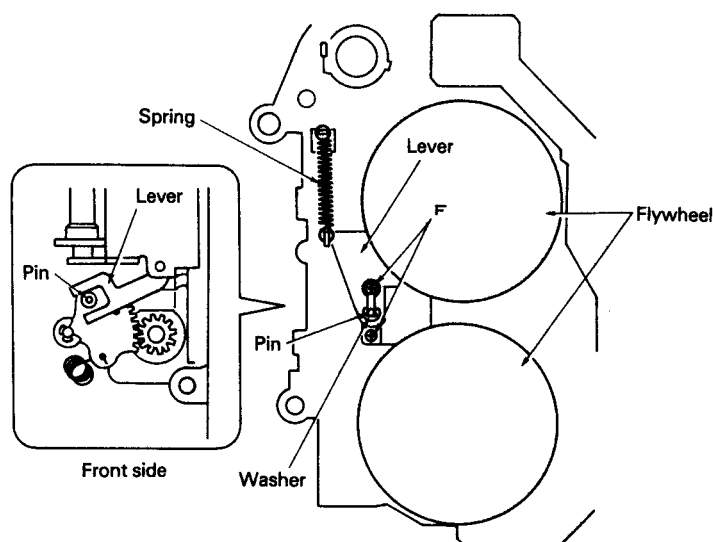


Fig. 4

• Sub-motor replacement (M1 and M2)

1. Remove the two screws labeled "G" and remove the P.C. board unit.
2. The sub-motor can be removed by removing the three screws indicated by the arrows.
3. Sub-motor 2 (for switching the FF/REW gear) can be replaced when the spacer has been removed. (The motor fits very snugly, so some force must be used to remove it.)
4. Sub-motor 1 (for turning and positioning the head) can be replaced by removing the belt, lock washer, pulley and two screws labeled "J".

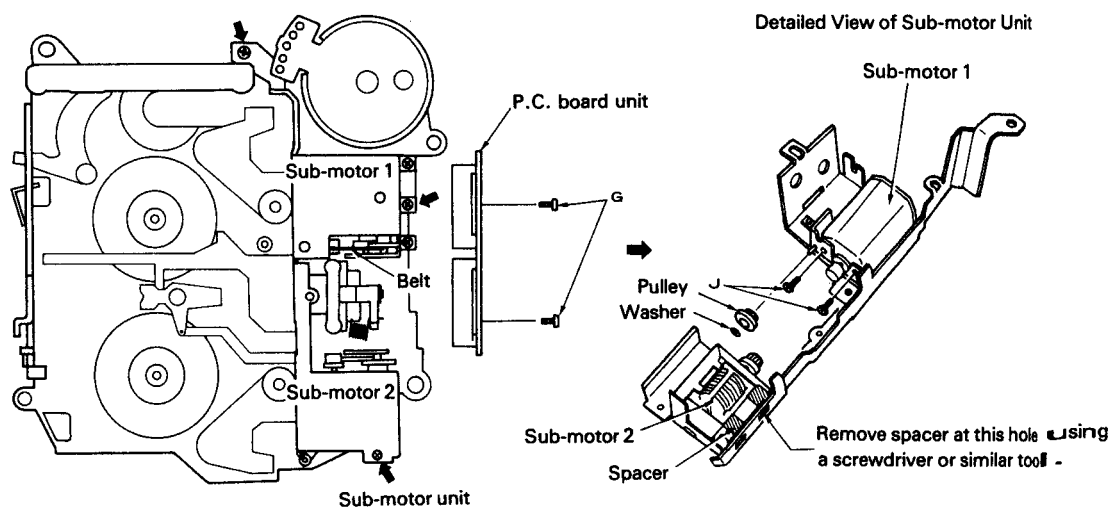


Fig. 5

• **Reel unit replacement**

1. Remove the six screws and the switch P.C. board.
2. Remove the screw labeled "K" and the collar and free the FF/REW idler gear.
3. The reel assy can be replaced by removing the two screws labeled "L" and removing the reel unit.

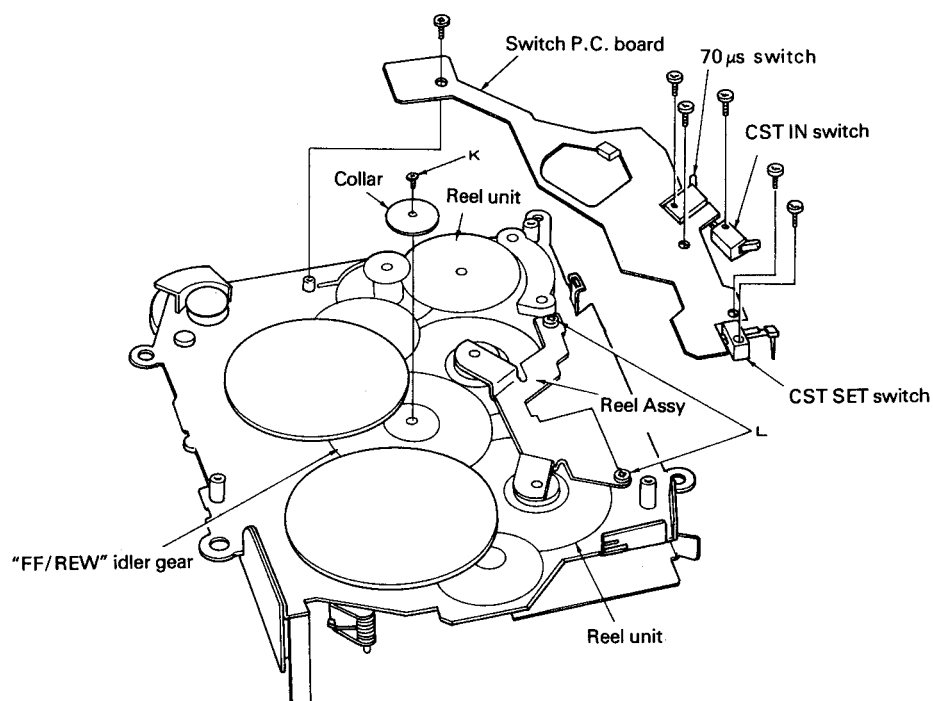


Fig. 6

2. MECHANISM DESCRIPTION

Cassette mechanism assy for CX-156/A is used in this mechanism description.

1. Outline of Mechanism

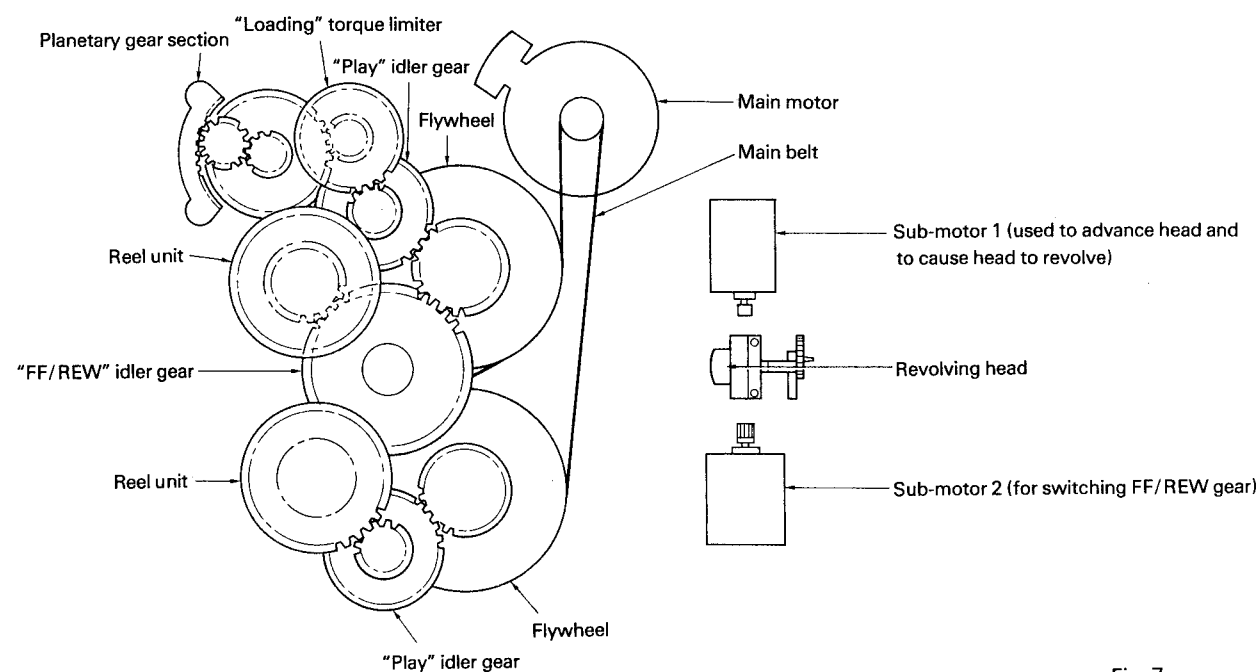


Fig. 7

2. Loading/Eject Function

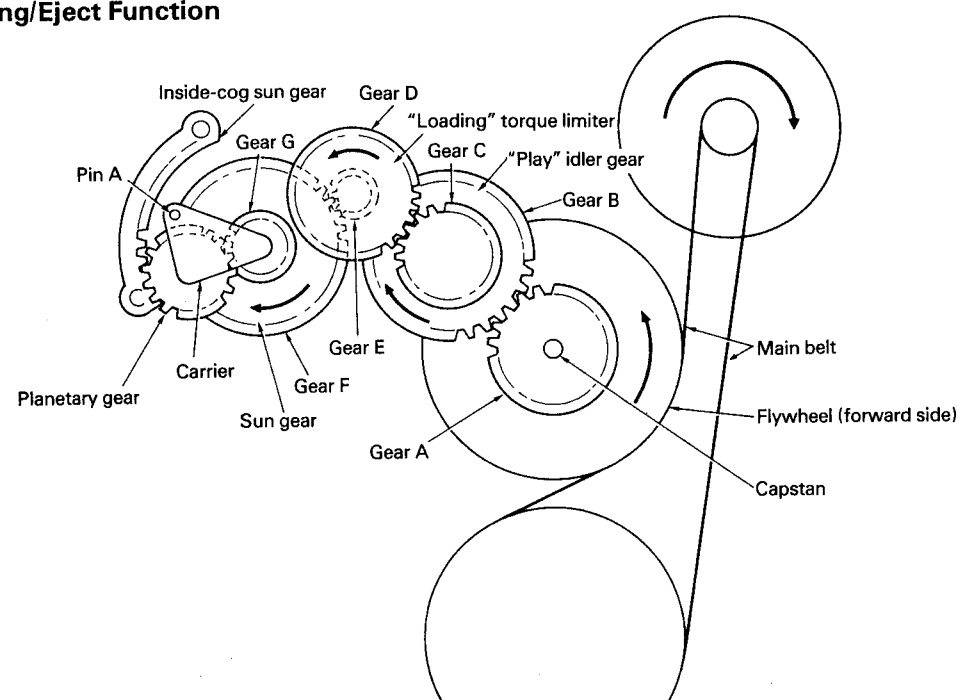


Fig. 8

3. Cassette Tape Load and Eject Mechanism

• Cassette tape loading operation

1. Push the cassette tape lightly in the direction indicated by the arrow. (As shown in Fig. 10, arm "A" and arm "B" connect to spring "A". These are also connected to common axis shaft "A", which is attached to the chassis surface and acts as a swivel. Pin "A", which is caulked to the planetary gear unit carrier, goes through the chassis and fits into the oblong hole of arm "B". Because pin "A" won't move as long as the capstan motor isn't moving, arm "B" won't move either.)
2. When a cassette tape is loaded, arm "A" moves in the direction indicated by the arrow and spring "A" loosens. Lever "A" also moves in the direction indicated by the arrow, and the catch at left of the lever releases arm "C". Arm "C" then turns counterclockwise and opens the CST IN switch. The capstan motor then begins turning forward.
3. The carrier then moves clockwise because the planetary gear moves along the inside-cog sun gear. Pin "A" which is caulked to the carrier also moves in the same direction. (Fig. 11) The movement of pin "A" is causing arm "B" to move counterclockwise. Arm "A" turns in the same fashion and the "A" unit of lever "A" draws the cassette tape in. (Fig. 9)

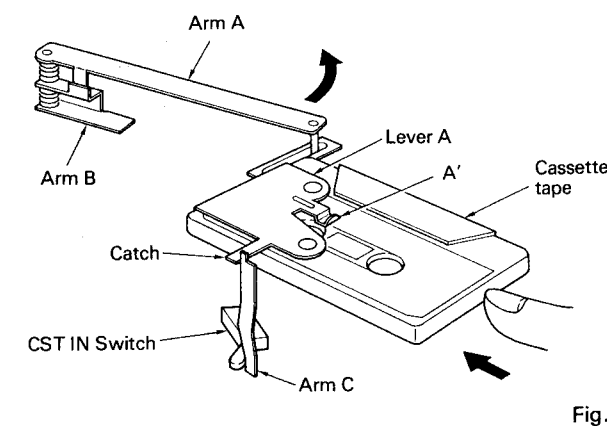


Fig. 9

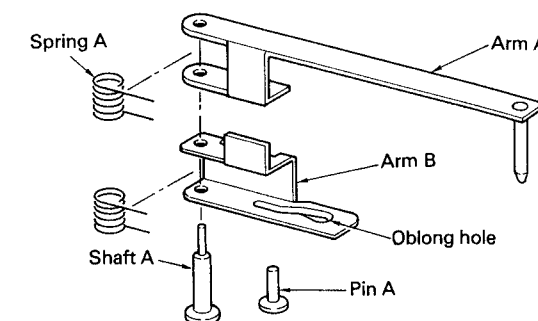


Fig. 10

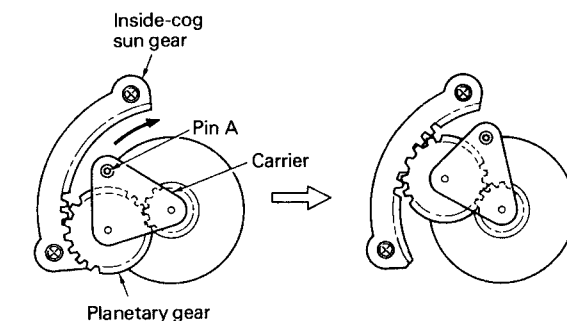


Fig. 11

4. The oblong hole of arm "B" is as shown in Fig. 12. The cassette tape draw-in process will be complete when the pin "A" degree of rotation is θ . Arm "B" will not move while the degree of rotation is θ' .

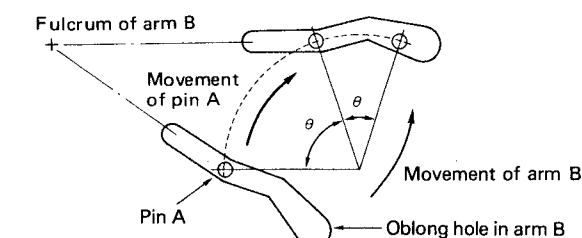


Fig. 12

5. As shown in Fig. 13, arm "C" (caulked to the chassis swivel) is fixed to pin "A" and when the degree of rotation is θ arm "C" is stationary, and when it is θ' arm "C" turns clockwise.

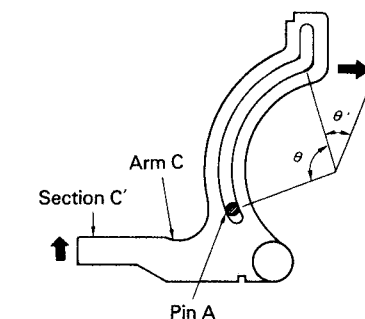


Fig. 13

- As shown in Fig. 14, the "C'" unit of arm "C" connects to the cassette arm (which suspends the cassette tape) through spring "C". The arm "C" movement described above in paragraph five makes the "C'" unit move in the direction indicated by the arrow in Fig. 14. The cassette arm pushes down holder "A" by means of spring "B". The "C'" unit is released when holder "A" drops down.
- In order for the capstan motor to keep turning forward, the planetary gear disengages from the inside-cog sun gear. The cassette tape is ejected following an operation opposite to the loading operation.

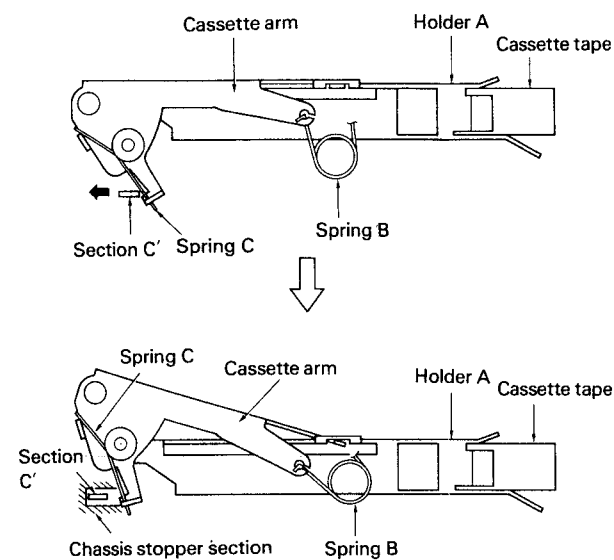


Fig. 14

4. Head Turning and Head Positioning Operations (during forward play)

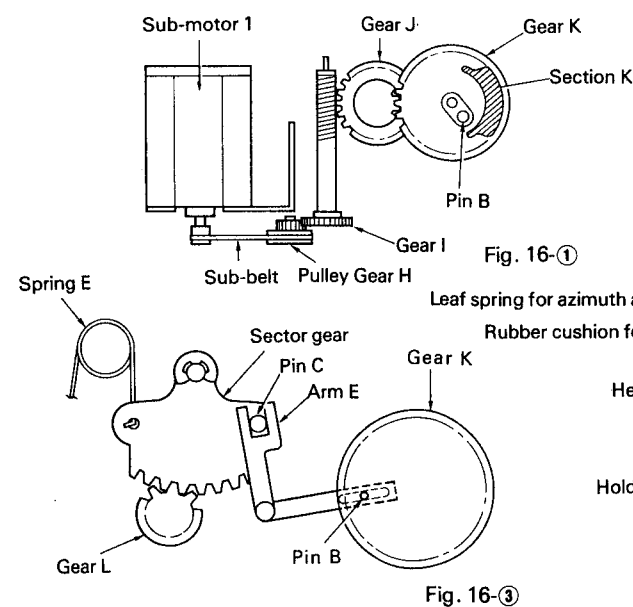


Fig. 16-1

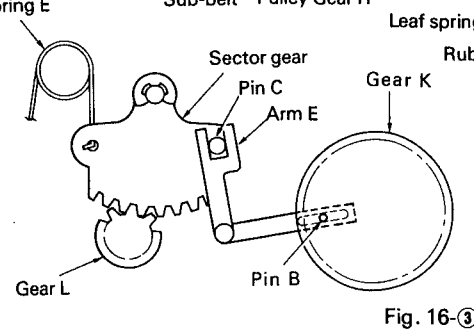


Fig. 16-3

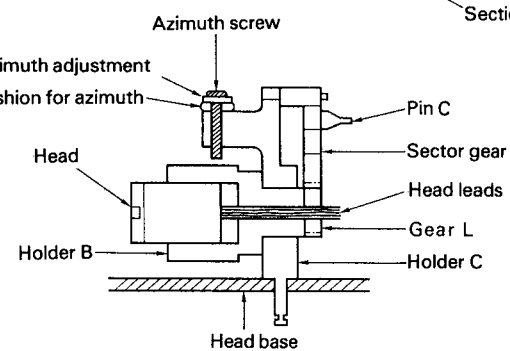


Fig. 16-4

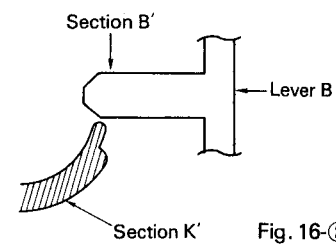


Fig. 16-2

• Eject operation

- Turning on the eject switch reverses the capstan motor. As shown in Fig. 15, spring "D" places slight friction on the planetary gear which causes it to engage with the inside-cog sun gear. The cassette tape is ejected following an operation opposite to the loading operation.

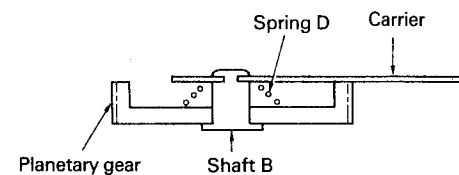


Fig. 15

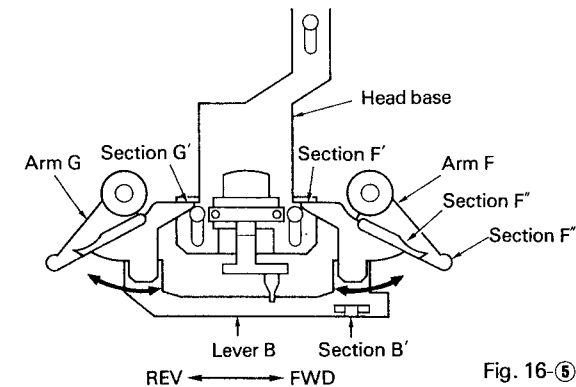


Fig. 16-5

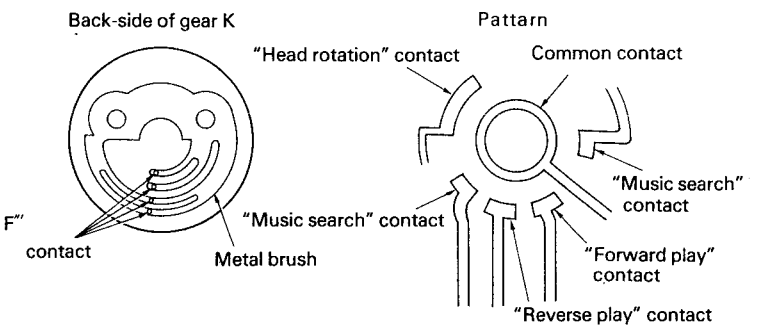


Fig. 16-6

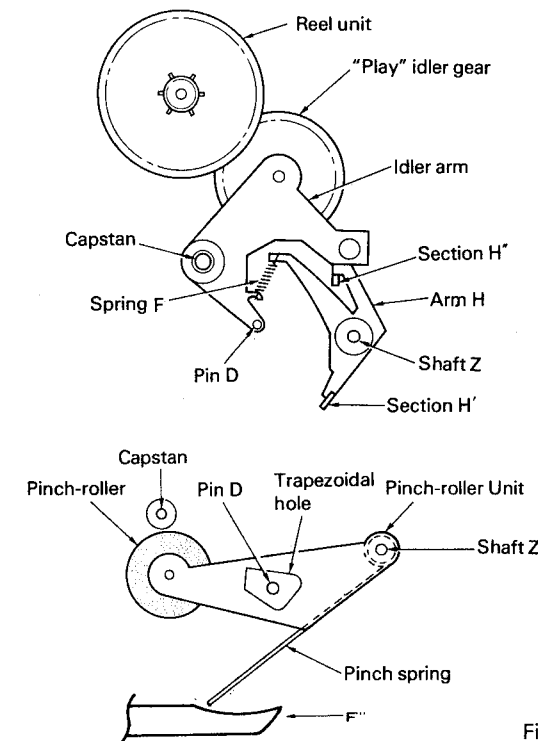
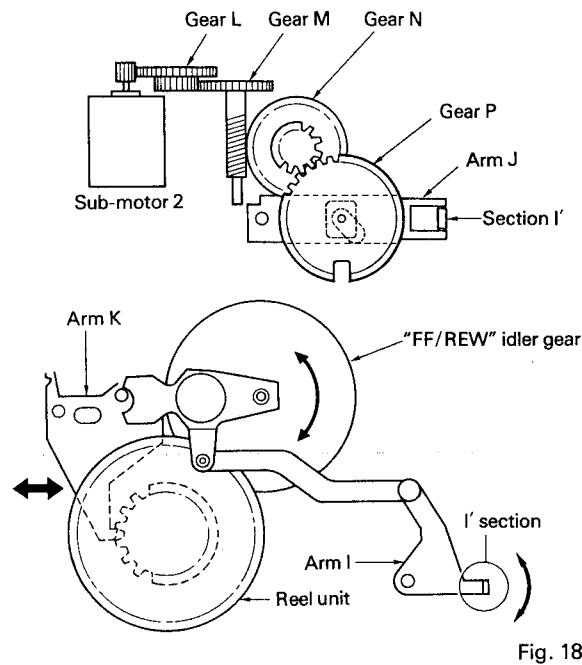


Fig. 17

- The sub-belt from sub-motor 1 goes through pulley gear "H", gear "I", gear "J" and turns gear "K". Head turning and head base positioning take place using the "K" unit (the projecting unit) of gear "K" and pin "B". There is a metal brush attached to the back of gear "K" which detects the passing through of all patterns and common patterns and stops sub-motor 1. This controls the head positioning, the head turning, the contact pressure of the play idler gear and the contact pressure of the pinch roller.
- Head turning at pin "B" takes place until gear "K" starts turning which brings the "K" part into contact with the lever "B", "B" part. (Fig. 16-3)
- Pin "B" engages with the arm "E" oval opening and rotates arm "E". The arm "E" sector gear is engaged with pin "C" and this turns the head. The head rotation pattern (Fig. 16-6) performs this operation inside a certain angle.
- When gear "K" turns it also pushes the lever "B", "B" part. The "B" part turns arm "F" and arm "G" counter-clockwise and advances head base with the arm "G", "G" part. (Fig. 16-2, 5)
- After the head base goes beyond the MS pattern (Fig. 16-6) position, the arm "F", "F" part pushes the pinch roller unit pinch spring and presses the pinch roller down onto the capstan. (Fig. 17)
- Simultaneously, the arm "F", "F" unit pushes the arm "H", "H" part. The "H" part lock releases when pushed, and the play idler gear comes into contact with the reel unit. Play operation begins because of this. (Fig. 16-5, Fig. 17)
- When going from play to eject, first, the pinch roller disengages from the capstan, and then using the pinch roller unit trapezoidal hole, releases the idler arm from the reel unit by means of pin "D". After that, the "H" unit again meshes with the idler arm and the "play" idler gear stops after completely disengaging from the reel unit.

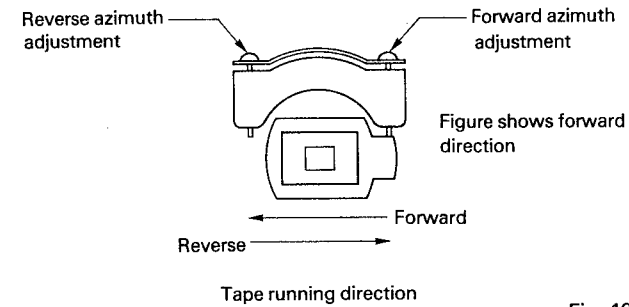
5. FF/REW Operation

1. As with the head operations a brush is attached to the back of gear "P" and using patterns and the brush, position sensing takes place and this controls the FF/REW operation.
2. Sub-motor 2 goes through gears "L", "M" and "N" and turns gear "P". When gear "P" turns, arm "I" rotates by means of arm "J". Arm "I" rotates the FF/REW idler gear and engages it with the reel unit.



3. ADJUSTMENT

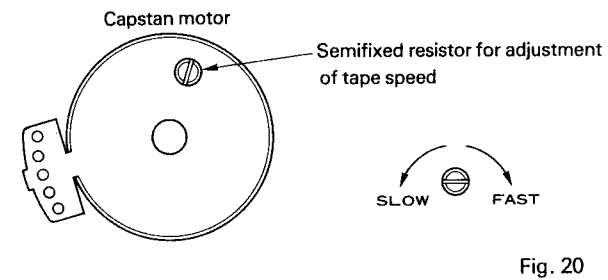
3.1 AZIMUTH ADJUSTMENT



• To Adjust

1. Play "A" side of STD-341A (10 kHz, -20 dB). Adjust each screw for maximum output in forward and reverse directions.
2. Play "B" side in forward and reverse directions to confirm adjustment.

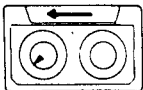
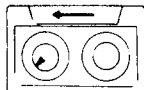
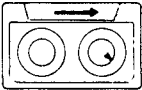
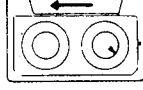
3.2 TAPE SPEED ADJUSTMENT



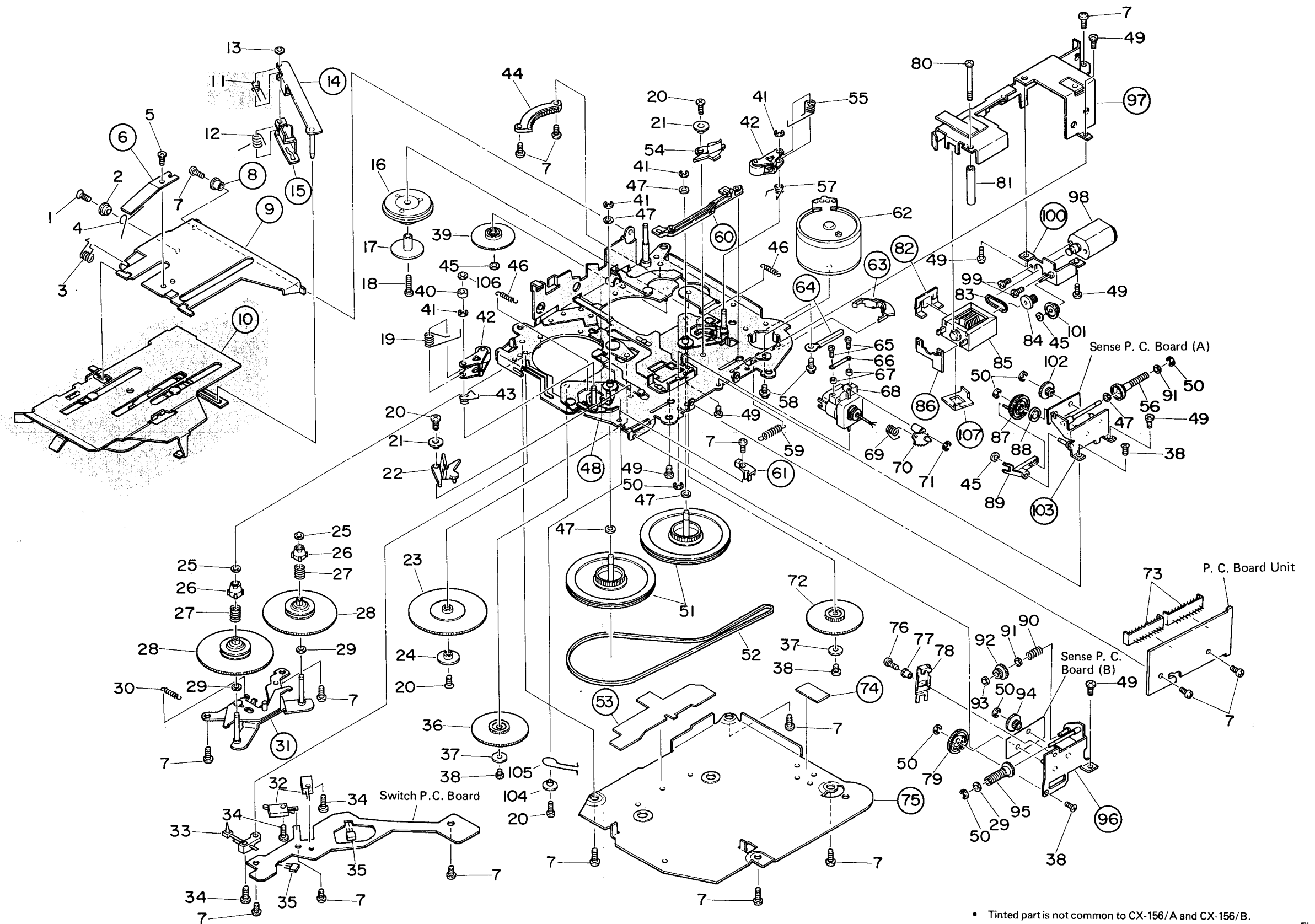
• To Adjust

1. Reproduce STD-301 (3 kHz, -10 dB). Adjust the semifixed resistor so that the frequency counter shows 3,010 Hz (+30 Hz, -30 Hz).

3.3 CHECK POINTS OF CASSETTE MECHANISM

<p>Confirm the following items when replacing parts of the cassette mechanism.</p>	<p>■ Tape speed deviation:</p> $3,000 \pm \frac{90}{30} \text{ Hz}$ $(4.76 \text{ cm/s} \pm \frac{3}{1} \%)$ <p>Using an STD-301, measure the speed at the start and end of winding and see that a deviation remains within the limits each time. If values indicated by the pointer vary considerably, adjust to 70% of the minimum and maximum values. Measuring time shall be 5~6 seconds.</p>	<p>■ Wow and flutter:</p> <p>Less than 0.15% (WMS)</p> <p>Using an STD-301, measure the wow and flutter at the start and end of winding and take the maximum value. If values indicated by the pointer vary considerably, adjust to 70% of the minimum and maximum values. Measuring time shall be 5~6 seconds.</p>
<p>■ Fast forward and rewinding time:</p> <p>95~115 seconds</p> <p>Using a C-60, set to fast forward and re-wind, and measure the time with a stop watch.</p>	<p>■ Winding torque:</p> <p>40~60 g·cm</p>  <p>Using a cassette type torque meter (100 g·cm), measure the minimum value while in the play mode. Measuring time shall be 5~6 seconds.</p>	<p>■ F.F. torque:</p> <p>70~110 g·cm</p>  <p>Using a cassette type torque meter (120 g·cm), measure the value when the tape stops in the F.F. mode.</p>
<p>■ REW torque:</p> <p>70~110 g·cm</p>  <p>Using a cassette type torque meter (120 g·cm), measure the value when the tape stops in the REW mode.</p>	<p>■ Back tension torque:</p> <p>2.0~3.5 g·cm</p>  <p>After setting in the REW mode without loading a cassette tape for 5 minutes, measure the back tension torque in the play mode, using a cassette type torque meter.</p>	<p>■ Cassette loading force:</p> <p>450~550 g</p> <p>Push the center of the cassette and measure the force with a tension meter (1 kg).</p>

4.EXPLODED VIEW



• Tinted part is not common to CX-156/A and CX-156/B.

Fig. 21

NOTE:

- For your Parts Stock Control, the fast moving items are indicated with the marks ★ ★ and ★.

★ ★: GENERALLY MOVES FASTER THAN ★.

This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

- Parts whose parts numbers are omitted are subject to being not supplied.

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	HBA-193	Screw M1.4×3.5		53.		Insulator
	2.	CLB-691	Collar		54.	CNW-931	Arm
	3.	CBH-837	Spring		55.	CBH-831	Spring
	4.	CBH-867	Spring		56.	CNW-956	Gear
	5.	HBA-147	Screw M1.4×1.4		57.	CBH-833	Spring
	6.		Spring		58.	PMS26P030FMC	Screw
	7.	BMZ20P040FMC	Screw		59.	CBH-830	Spring
	8.		Bush		60.		Lever
	9.		Arm		61.		Spacer
	10.		Holder Unit (CX-156/A)	★ ★	62.	CXM-161	Motor (Capstan)
			Holder Unit (CX-156/B)		63.		Clamper
	11.	CBH-836	Spring (CX-156/A)		64.		Clamper
		CBH-887	Spring (CX-156/B)		65.	CBA-173	Screw M1.4×8
	12.	CBH-886	Spring		66.	CBE-114	Spring
	13.	CBF-046	Washer		67.	CNY-134	Azimuth Rubber
	14.		Arm Unit	★ ★	68.	CXD-758	Head Unit
	15.		Arm		69.	CBH-829	Spring
	16.	CXD-388	Gear Unit		70.	CNW-939	Gear
	17.	CLB-617	Collar		71.	YE15FUC	Washer
	18.	CBA-166	Screw M1.7×8		72.	CNW-943	Gear
	19.	CBH-832	Spring		73.	CKS-534	Plug
	20.	HBA-310	Screw M2×3.5		74.		Insulator
	21.	CLB-612	Collar		75.		Cover
	22.	CNW-930	Arm		76.	HBA-158	Screw M1.4×5
	23.	CNW-944	Gear		77.	CLB-750	Collar
	24.	CLB-616	Collar		78.	CNH-004	Arm
	25.	CBF-135	Washer		79.	CNW-953	Gear
	26.	CNW-932	Collar		80.	CBA-165	Screw M2
	27.	CBH-827	Spring		81.	CLB-749	Spacer
★ ★	28.	CXD-384	Reel Unit		82.		Spacer
	29.	CBF-088	Washer	★ ★	83.	CNT-114	Belt
	30.	CBH-868	Spring		84.	CNW-941	Gear
	31.		Bracket Unit	★ ★	85.	CXM-351	Motor (Gear Position)
★ ★	32.	CSN-091	Switch (70μs, CST IN)		86.		P.C. Board
★ ★	33.	CSN-089	Switch (CST SET)		87.	CNW-952	Gear
	34.	CBA-172	Screw M1.7×5.5		88.	CNN-481	Spacer
★	35.	SDME106A	Magnetic Resistive Device		89.	CNW-958	Arm
	36.	CNW-943	Gear		90.	CBH-866	Spring
	37.	CLB-615	Collar		91.	HBF-116	Washer
	38.	HBA-209	Screw M2×2		92.	CNW-954	Gear
	39.	CNW-950	Gear		93.	CBF-135	Washer
	40.	CLB-690	Roller		94.	CNY-077	Gear
	41.	EBG-001	Washer		95.	CNY-148	Gear
★ ★	42.	CXD-387	Pinch Roller Unit		96.		Holder Unit
	43.	CBH-834	Spring		97.		Guide
	44.	CNW-951	Gear	★ ★	98.	CXM-452	Motor (Head Position)
	45.	CBF-126	Washer		99.	HBA-244	Screw M1.4×1.6
	46.	CBH-835	Spring		100.		Bracket Unit
	47.	HBF-179	Washer		101.	CNY-075	Pulley
	48.		Chassis Unit (CX-156/A)		102.	CNW-955	Gear
			Chassis Unit (CX-156/B)		103.		Holder Unit
	49.	HBA-175	Screw M2×2.5		104.	CLB-760	Collar
	50.	YE12FUC	Washer		105.	CBH-893	Spring
	51.	CNW-942	Flywheel		106.	HBF-180	Washer
★ ★	52.	CNT-111	Belt		107.		Cover

5.CONNECTION DIAGRAM

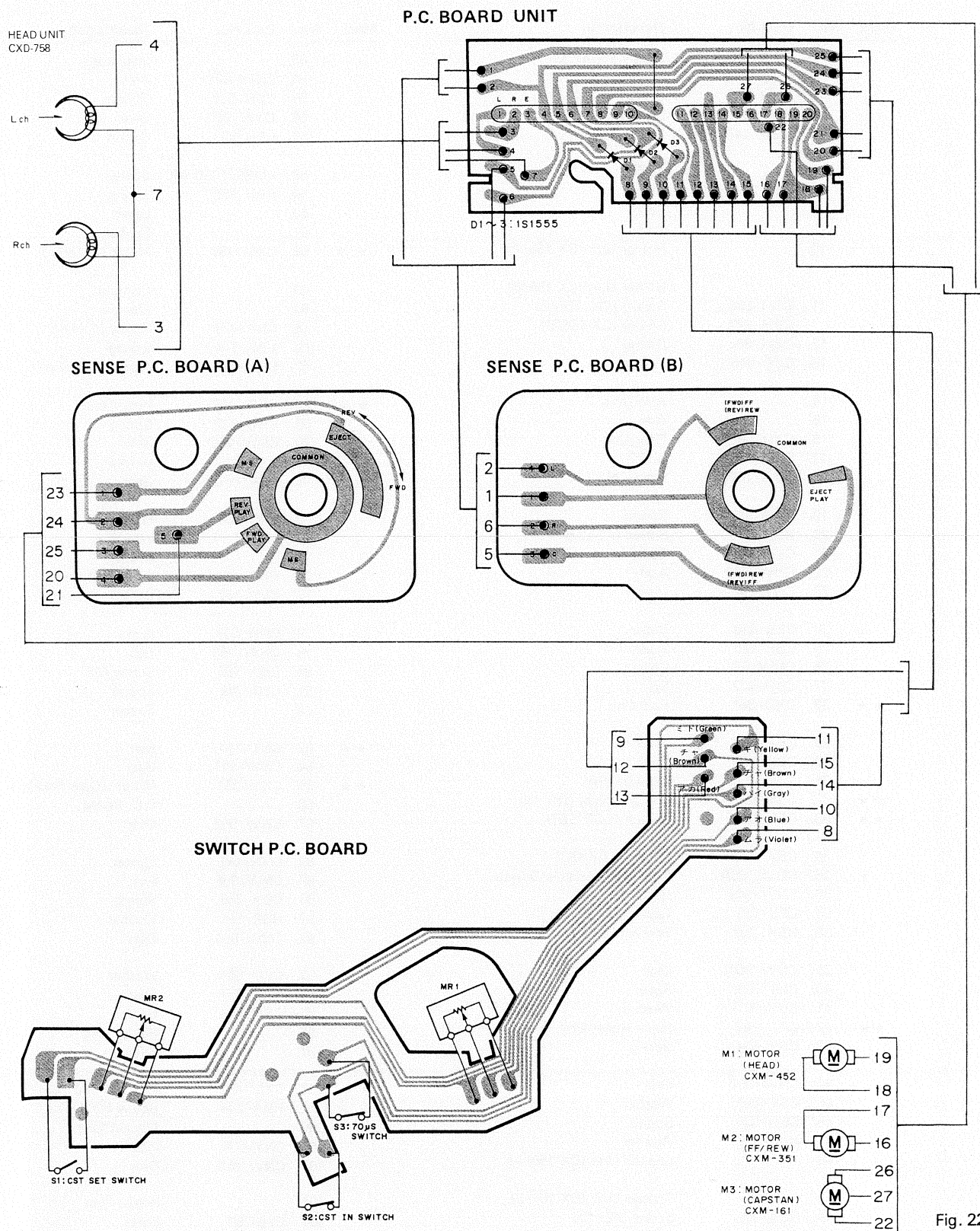
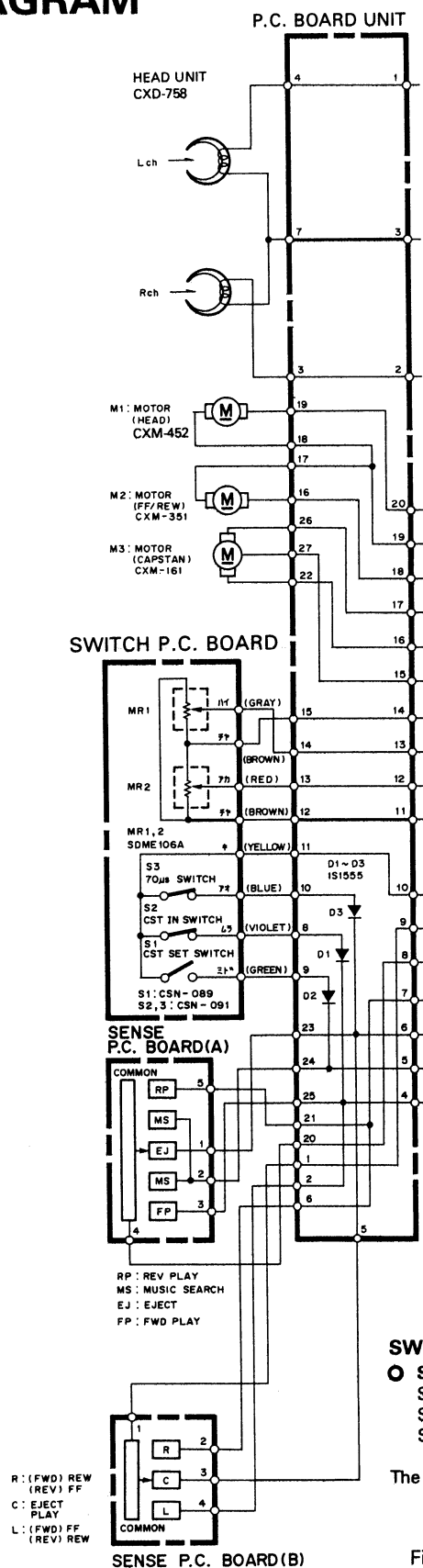


Fig. 22

6. SCHEMATIC CIRCUIT DIAGRAM



SWITCHES

○ SWITCH P.C. BOARD

- S1: CST SET SWITCH..... ON—OFF
S2: CST IN SWITCH..... ON—OFF
S3: 70 μ s SWITCH..... ON (120 μ s)—OFF (70 μ s)

The underlined indicates the switch position.

7. ELECTRICAL PARTS LIST

Switch P.C. Board

Mark	Symbol & Description	Part No.
★ ★	S1 Switch (CST SET)	CSN-089
★ ★	S2, S3 Switch (CST IN, 70 μ s)	CSN-091
★	MR1, MR2 Magnetic Resistive Device	SDME106A

P.C. Board Unit

Mark	Symbol & Description	Part No.
★	D1—D3	1S1555

Miscellaneous Parts List

Mark	Symbol & Description	Part No.
★ ★	Head Unit	CXD-758
★ ★	M1 Motor (Head)	CXM-452
★ ★	M2 Motor (Gear)	CXM-351
★ ★	M3 Motor (Capstan)	CXM-161

Fig. 23